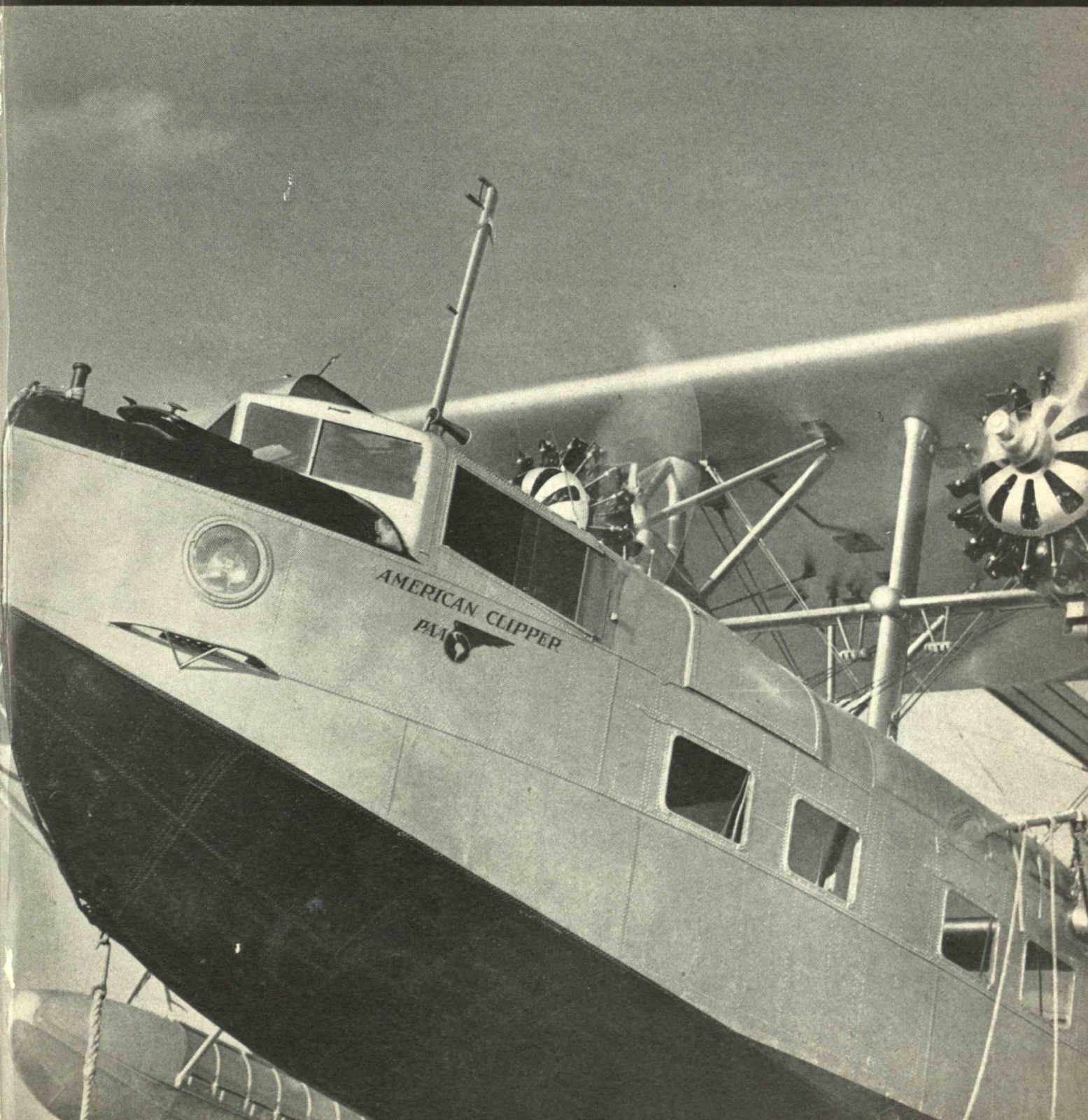


July 1947

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



technology review

Published by MIT

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FORGINGS...

To Control
PRESSURE

THE
HARVEY

METAL CORPORATION

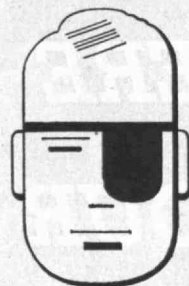
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COST OF ONE MAJOR EYE ACCIDENT

1.50



AVERAGE COST OF ONE PAIR SAFETY GOGGLES

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BY PREVENTING 1 EYE ACCIDENT

Above is the simple arithmetic of what one major eye accident involves—and the relatively *infinitesimal* cost of the means to prevent it. Some authorities put the direct cost of major eye accidents even higher—at \$351 and estimate the hidden or indirect expense as *4 times as much* in terms of idle machines, lowered production, cost of time lost by injured employee, foremen and others and additional factors. Why risk even one eye accident that

can add to today's burden of pyramided costs? 98% of eye accidents can be prevented by the use of safety goggles, according to the Society for the Prevention of Blindness. Your AO Safety Representative has complete facts and figures which prove that adequate eye protection can lower *your* costs.

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AGAINST THE COST
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A single hurried or careless job with an *ordinary* heavy marine rope can throw a distortion or back-kink into it that seriously shortens its life, weakens its strength, and adds to your operating costs.

Slevelay's marvelous combination of *strength, flexibility, easy-handling* and resistance to careless use comes from its exclusive, concentric sheaths of unspun fibers. These "sleeves" prevent the interchange of the rope's inner and outer yarns, which is the actual cause of distortion. The larger the rope, the greater the risk of back-kink in ordinary rope through inexperienced handling—and *the greater* the value of *Slevelay* in *avoiding* that common form of rope destruction.

Slevelay, made *exclusively* by *Plymouth*, is available through your local Plymouth supplier, in 5½ inch circumference and larger sizes.

PLYMOUTH CORDAGE COMPANY
Plymouth, Massachusetts.

PLYMOUTH
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THE ROPE YOU CAN TRUST BECAUSE IT IS ENGINEERED FOR YOUR JOB

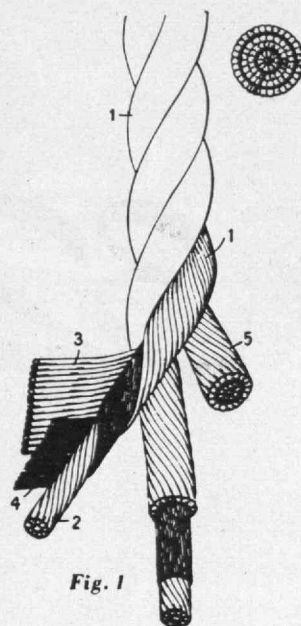


Fig. 1

Why Slevelay Has No Back-Kink

The diagram above shows why and how Slevelay's unique construction gives this Plymouth Marine rope its exclusive combination of *strength, flexibility* and *freedom from back-kink*. The following key explains the outstanding features of Slevelay construction:

1.

(above) outer surface of strand, (below) same strand, showing course of spun yarns.

2.

Center yarns, which in "Slevelay" are left-twisted, being opposite to the twist imparted to center yarns in rope of usual construction.

3.

Cover yarns.

4.

The "sleeve"—a thin, broad sheet of barrier fiber, partitioning center yarns from cover yarns.

5.

End view of strand.

Providing Walking Safety WITH ABRASIVES!



NORTON FLOORS are Non-slip... *Wet or Dry*

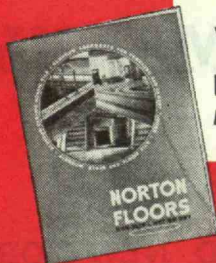
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You will find NORTON FLOORS providing safe walkways in thousands of buildings the country over. Catalog 1935-A gives the full story including sizes and colors. Write for a copy — no obligation.

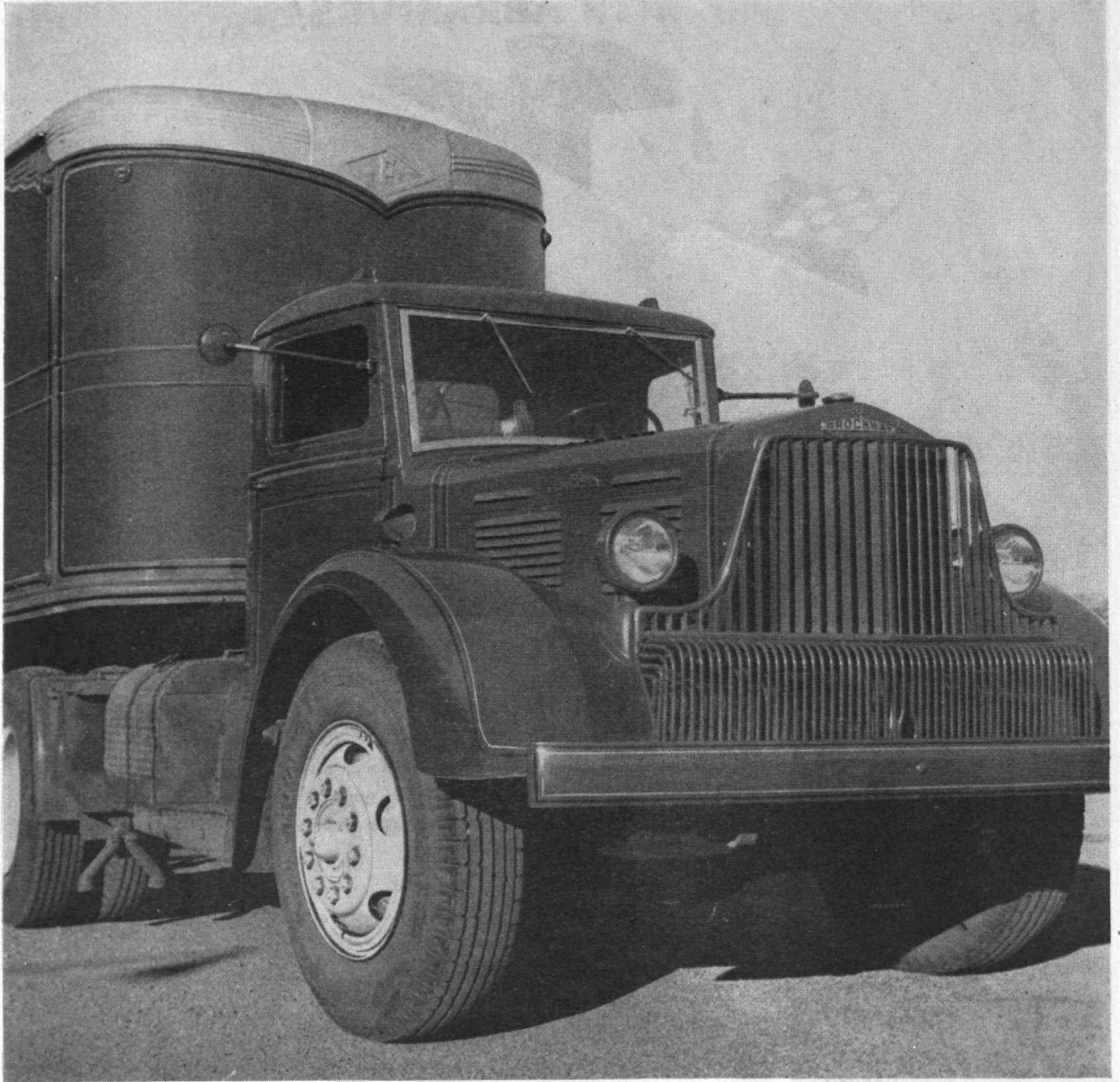
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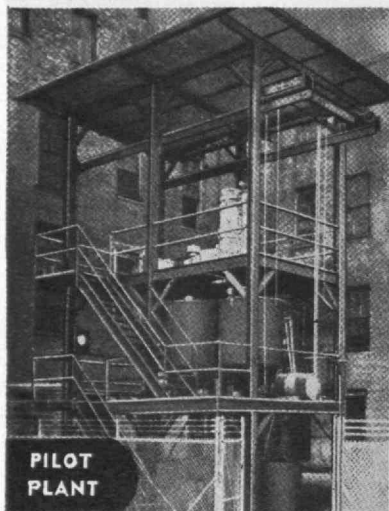
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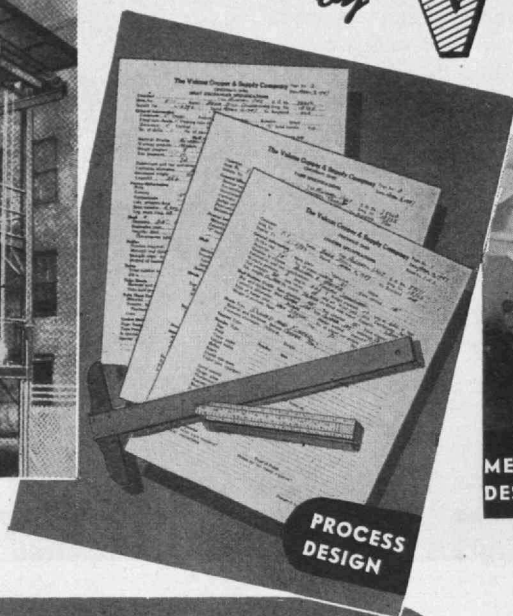
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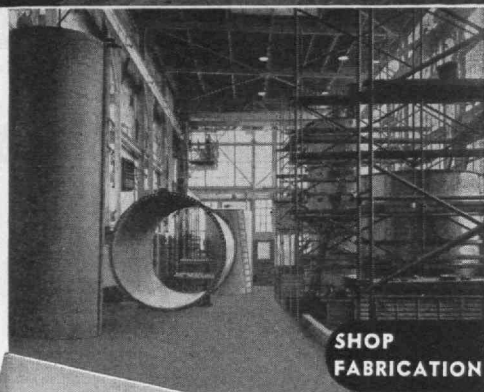
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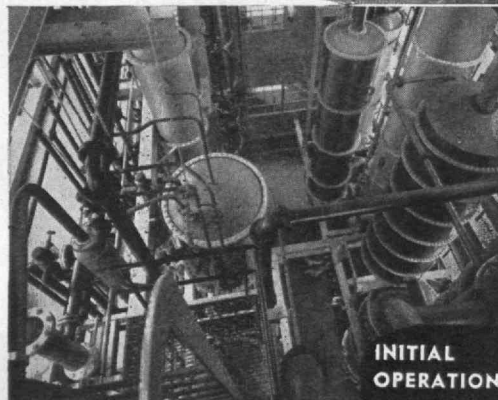
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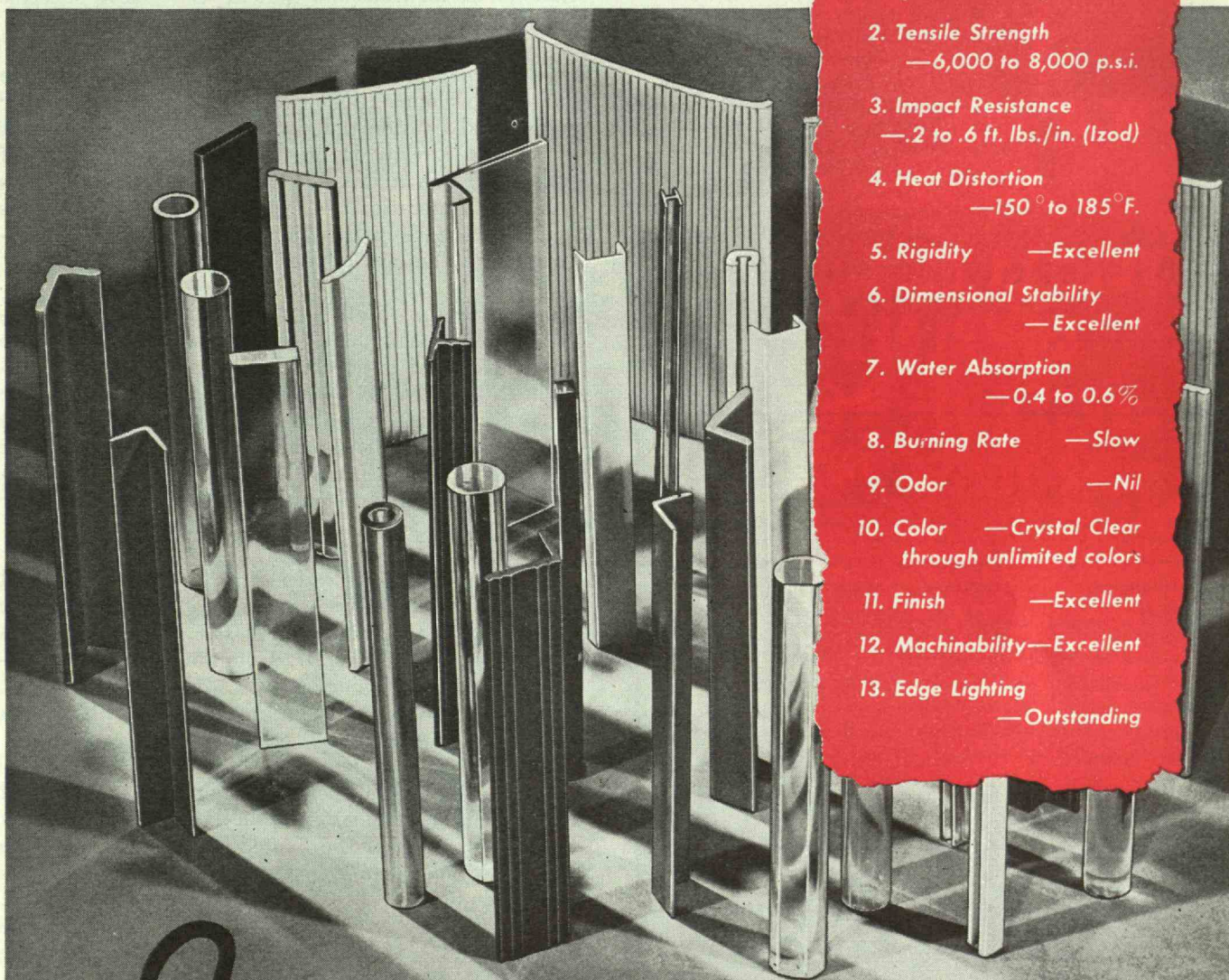
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METHYL methacrylate under the trade names *Plexiglas* and *Lucite* proved during the war that serviceability equalled its outstanding beauty. Sandee is happy to add *extruded acrylic sections* to its ever growing list of successful Sandee extrusions.

Now, simple and complex shapes in small and moderate sizes and in crystal clear, transparent or translucent color can be extruded to add all of the inherent beauty and serviceability of this material to your products. Rods and tubes in sizes under $\frac{1}{2}$ " diameter could also be extruded to meet your specifications. Study the excellent physical and chemical properties of this material, add its outstanding visual appeal, then call on Sandee for those long sought, specially designed sections.



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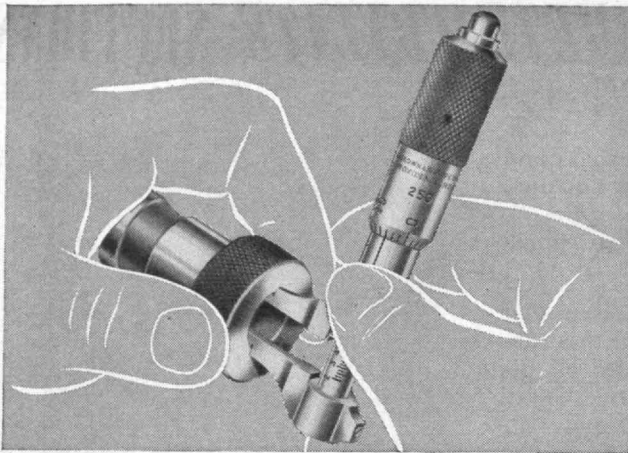
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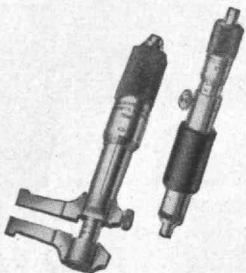
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appreciate the relief afforded by making use of the Agency Service of our Trust Department. By this means they can free themselves from the necessity of watching investment trends as well as from the tedious details of cutting coupons, collecting other income, making up income tax returns, etc. At the same time, if they so desire, they may retain complete control over decisions as to changes in their holdings. This plan enables the business man to direct his faculties entirely to the development of his own enterprises.

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THE TABULAR VIEW

A vigorous program of aircraft research to maintain national security and further develop commercial enterprise was advocated in the Alumni Day symposium address (page 523) of GENERAL GEORGE C. KENNEY, '11, Commander, Strategic Air Forces. General Kenney's address also stimulates thinking as to the types of research most urgently needed at the present time.

Looking forward to the time, not so far in the future, when families may spend the major part of their two weeks' vacation on other continents through air travel, JOHN C. LESLIE, '28, Vice-president of Pan American World Airways, urges (page 525) a strong American commercial air-transport system as a most effective means of cementing international relations.

Unsolved mysteries of the behavior of the gas turbine and the development of this means of motive power for commercial aviation will give way before the onslaught of research already in progress. Such is the belief of ARTHUR E. RAYMOND, '21, Vice-president of the Douglas Aircraft Corporation, as expressed (page 527) in his address "Future of Gas Turbines in Aviation" delivered at the Alumni Day symposium.

Management problems of the Atomic Energy Commission raise as many, and as serious, problems as the purely technical ones of utilizing nuclear forces. CARROLL L. WILSON, '32, General Manager of the Atomic Energy Commission, makes an appeal to all (page 529) not only to learn the significance of atomic energy but to aid the Atomic Energy Commission in its most difficult assignment in developing peacetime uses for nuclear forces.

Needed by tomorrow's leaders is an objective, analytical approach in dealing with future problems, PRESIDENT COMPTON told the graduating class, in exercises at Boston's Symphony Hall. Dr. Compton's address is recorded in full, beginning on page 531; his annual report to Alumni, delivered at the Alumni Banquet, appears on page 537 of this issue of The Review.

In recalling the brief period during which the United Nations has been in existence, the HONORABLE WARREN R. AUSTIN, Chief of the United States Mission to the United Nations, spoke encouraging words to graduates in his commencement address recorded on page 533. But, supplementing the hope for a great future for the United Nations, is the need for the United States to be willing and able to stand behind its commitments.

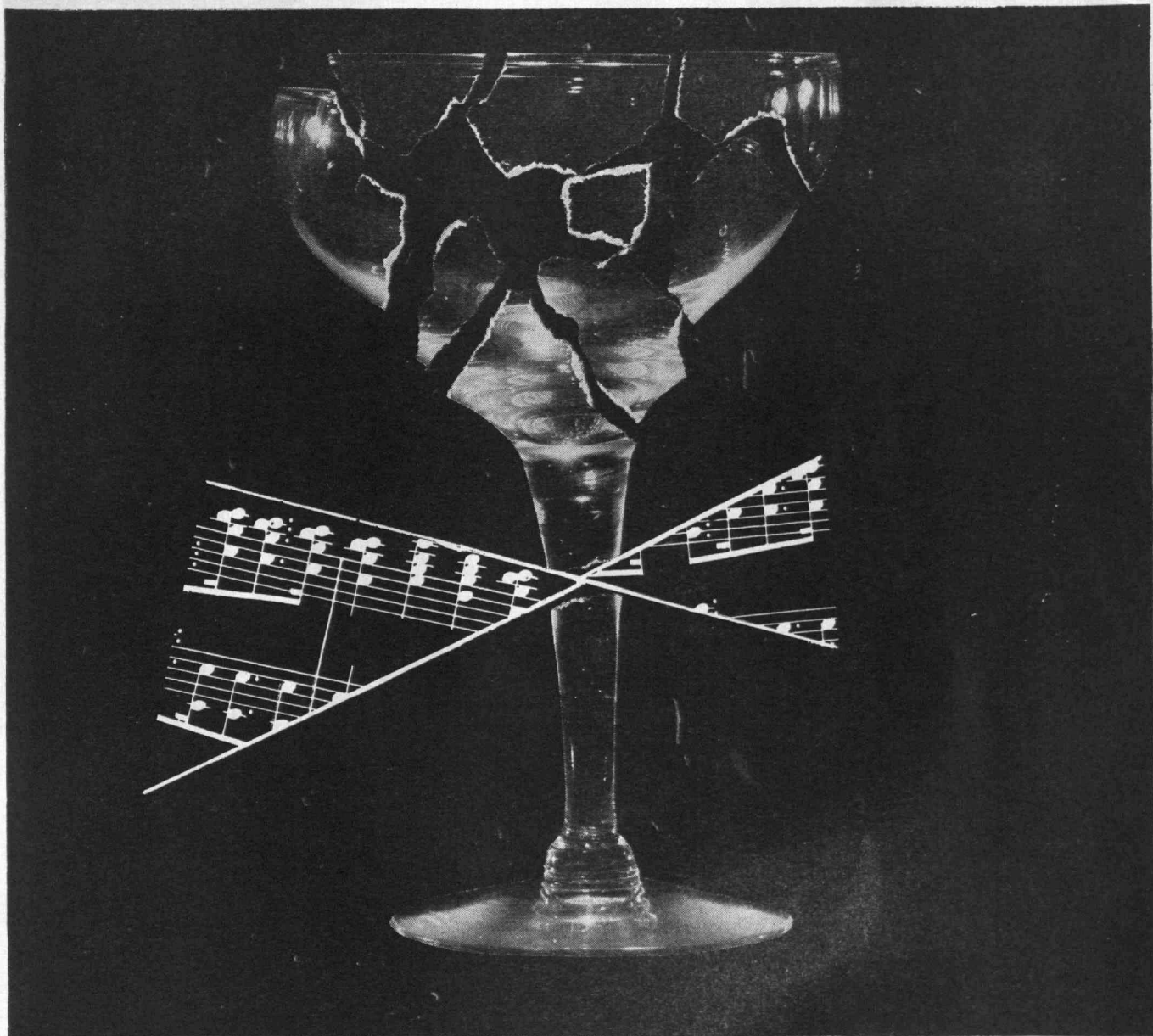
The Review is not published during the summer months following July. This issue, therefore, concludes Volume 49. Number 1 of Volume 50 will be published on October 27 and dated November. Readers who bind their copies are reminded that if they possess nine issues of Volume 49, their files are complete. An index to the volume will be ready on September 30 and will be supplied post free upon request.

A FEW NOTES TO REMEMBER

It is possible to shatter a wine glass with a sustained musical note because the glass is too brittle to distribute the peak stresses that are set up by resonance.

For the same reason, failure can result in a brittle steel, with far more serious consequences than a mere broken glass.

One way to increase safety factor and to obtain many other advantages, is to specify temper-brittle-free molybdenum steels. These modern steels, which also provide good hardenability, good strength-weight ratio, and economy, are permitting many users to simplify—and save. Write for practical data.

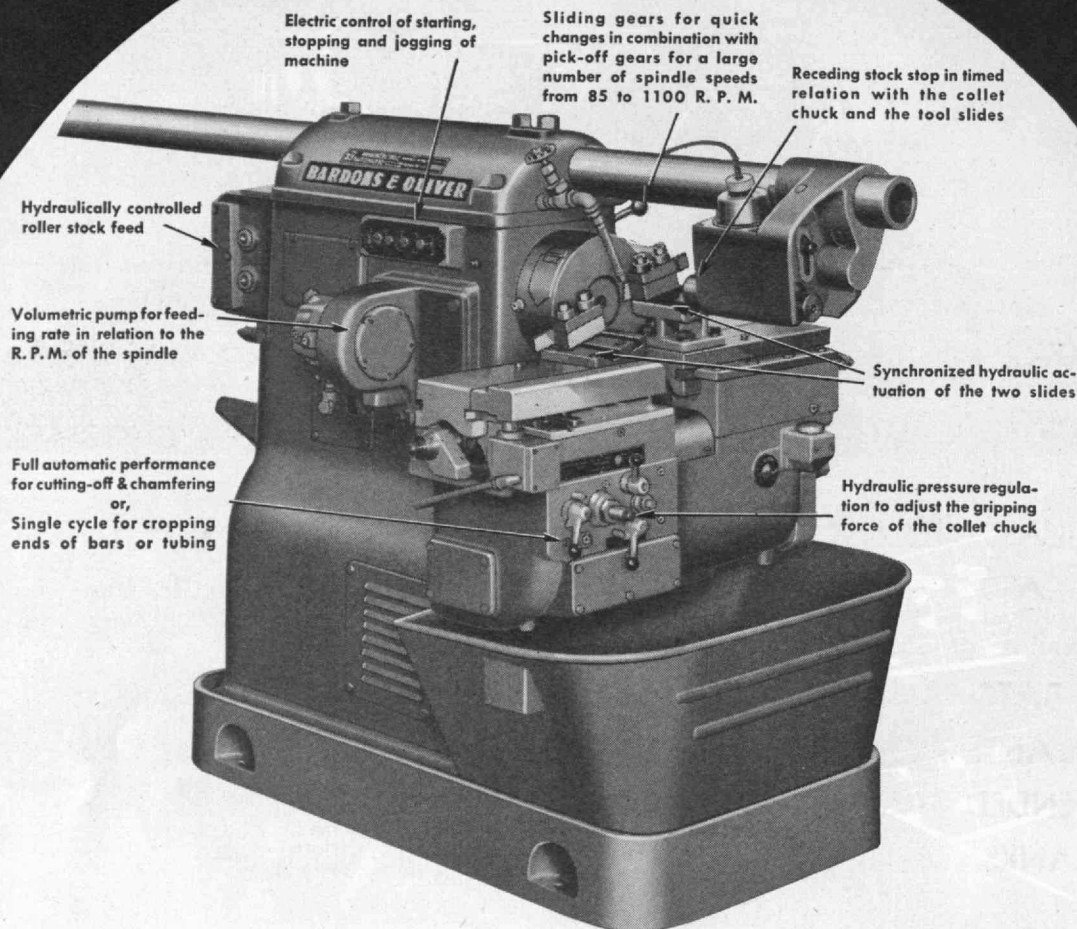


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With the acquisition of the Surges Electric Company of Milwaukee, Hevi Duty can now offer quality dry type air cooled transformers with or without tap changing switches as well as special transformers for special requirements. An accelerated program of modernization will present opportunities for increased production and good delivery schedules.

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HAROLD E. KOCH '22, President

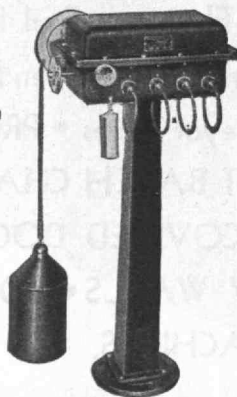
ELTON E. STAPLES '26, District Manager, Cleveland

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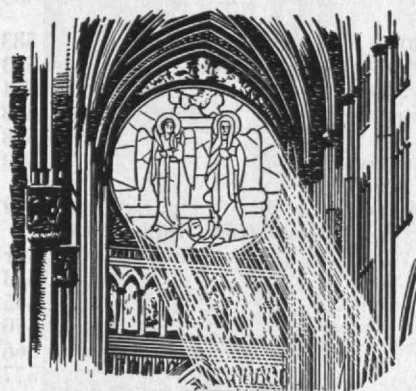
INDEX TO ADVERTISERS

July, 1947

Advertiser	Page
Albert Pipe Supply Company, Inc.	581
American Gage and Machine Company	552
American Optical Company	497
American Optical Company, Scientific Instrument Division	565
The Arnold Engineering Company	561
Associated Traders, Inc.	574
The Barbasol Company	576
Bardons and Oliver, Inc.	506
W. J. Barney Corporation	510
H. K. Barrows	583
Beech-Nut Packing Company	579
Boston Manufacturers Mutual Fire Insurance Company	551
Brockway Motor Company, Inc.	500
Brooks Brothers	556
Brown and Sharpe Manufacturing Company	504
T. G. Buckley Company	581
Buff and Buff Manufacturing Company	580
Godfrey L. Cabot, Inc.	501
Chauncy Hall School	582
Chrysler Corporation	515
Wallace Clark and Company	583
Clifford Manufacturing Company	547
Climax Molybdenum Company	505
William H. Coburn and Company	580
Combustion Engineering Company, Inc.	555
Converse Rubber Company	514
J. C. Corrigan Company	580
The Cosma Laboratories Company	583
Diefendorf Gear Corporation	510
Division of Industrial Cooperation	584
Doelcam Corporation	581
The Dwight Building Company	581
Eadie, Freund and Campbell	583
Eagle Signal Corporation	560
Electro Metallurgical Company	509
Electro Sun Company	564
Fabric Research Laboratories, Inc.	583
Far Eastern Manager, Box D	582
Fay, Spofford and Thorndike	583
Flush-Metal Partition Corporation	512
Frazier-Simplex, Inc.	507
General Radio Company	Outside Back Cover
Gilbert Associates, Inc.	583
Goodyear Tire and Rubber Company	516
W. C. Hamilton and Sons	566
Harvey Metal Corporation	Inside Front Cover
Healy-Ruff Company	508
Hevi Duty Electric Company	508
Hevi Duty Electric Company	568
The A. F. Holden Company	569
Holmes & Narver	578
Huntington School	582
Hydraulic Equipment Company	568
Industrial Rayon Corporation	571
Jackson and Moreland	583
H. A. Kuljian and Company	583
Leonard Construction Company	582
The Liquid Carbonic Corporation	562
Lord Electric Company	577
The Lummus Company	557
McCreery and Theriault	578
Manufacturers Mutual Fire Insurance Company	567
Mason-Neilan Regulator Company	549

(Concluded on page 510)

THE STORY OF MANGANESE



12th CENTURY BEAUTY

1 Manganese minerals were known in ancient times and were used to produce the rich colors of medieval stained glass windows. However, it was not until 1774 that the metal manganese was isolated. It became important to steelmakers in 1856 when Sir Robert Mushet used it to perfect the bessemer process.



MOVING MOUNTAINS

2 Mountains of manganese ore from such far-off places as Africa, Russia, India, and Brazil are shipped each year to the United States to meet our nation's requirements. In Electromet's furnaces, these ores are reduced to ferromanganese, silicomanganese, and other alloys of high purity.



TAMING THE BREW

3 Manganese is the most important alloy used in steelmaking. It has a powerful attraction for oxygen and sulphur—gathering and removing these impurities as a slag during the deoxidizing process. One of the best of all deoxidizers is silicomanganese—a combination alloy of silicon and manganese.



SQUEEZE PLAY

4 By combining with sulphur, manganese removes the principal cause of hot-shortness—thereby giving steel better rolling and forging properties. It imparts great strength and toughness, and that's why all steels—castings, forgings, and rolled products—contain at least small amounts of this metal.




PUTTING MUSCLE IN STEEL

5 Manganese makes steel tough. Steel containing about 13 per cent manganese is "work-hardening," that is, it possesses the property of increasing in hardness as the metal is worked. Steam shovel teeth, crushing machinery, and railroad switch frogs would quickly wear out, were it not for this property.

Aid To Steelmakers

Electromet's staff of experienced and well trained metallurgical engineers are always ready to assist steelmakers with the proper use of ferro-alloys, and help solve other metallurgical problems relating to melting procedures. These men are familiar with the most efficient and up-to-date shop practices. Their specialized knowledge has assisted customers in solving many metallurgical problems. For further information write for our booklet "Electromet Products and Service."

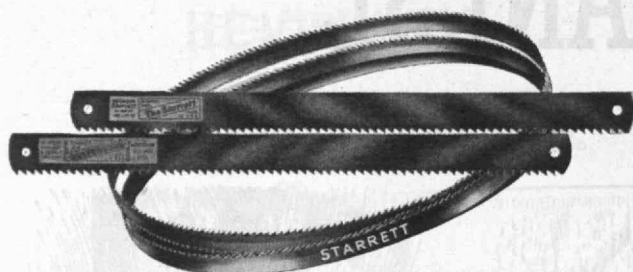
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DIEFENDORF GEARS

Index to Advertisers

(Concluded from page 508)

Frank Massa	583
Monsanto Chemical Company (Merrimac Division)	582
Moran, Proctor, Freeman and Mueser	583
Murray Printing Company	579
National Company, Inc.	563
William D. Neuberger Company, Inc.	580
Norton Company	499
Palmer Russell Company	583
Phelps Dodge Copper Products Corporation	513
Pilot Packing Company, Inc.	554
Plymouth Cordage Company	498
Poor and Company	558
Precision Products Company	580
Albert Ramond and Associates, Inc.	579
Raybestos-Manhattan, Inc. (Manhattan Rubber Division)	Inside Back Cover
Maurice A. Reidy	583
Revere Copper and Brass, Inc.	545
Rogers Peet Company	570
The Rumford Press	566
Harold J. Ryan, Inc.	577
Samson Cordage Works	562
Sandee Manufacturing Company	503
Sawyer Construction Co.	577
Scully Signal Company	553
Simplex Wire and Cable Company	564
Sinclair Refining Company	573
Stahleker Steel Corporation	582
Standard Dry Kiln Company	574
Starkweather Engineering Company	583
The L. S. Starrett Company	510
State Street Trust Company	504
Stone and Webster Engineering Corporation	559
Syska and Hennessy	582
The Taft-Peirce Manufacturing Company	546
Thomas Taylor and Sons, Inc.	575
The Tredennick-Billings Company	572
Morton C. Tuttle Company	550
Union Carbide and Carbon Corporation	509
Boris M. Volynsky Manufacturing Company	580
Vulcan Copper and Supply Company	502
Westinghouse Electric Corporation	511

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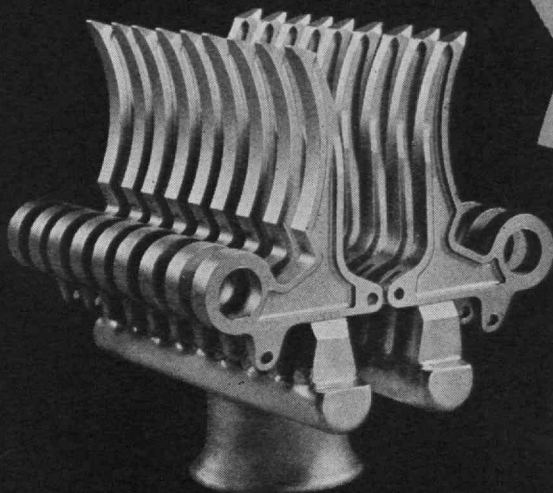
whom we have had the pleasure
of serving since 1919

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101 PARK AVENUE, NEW YORK

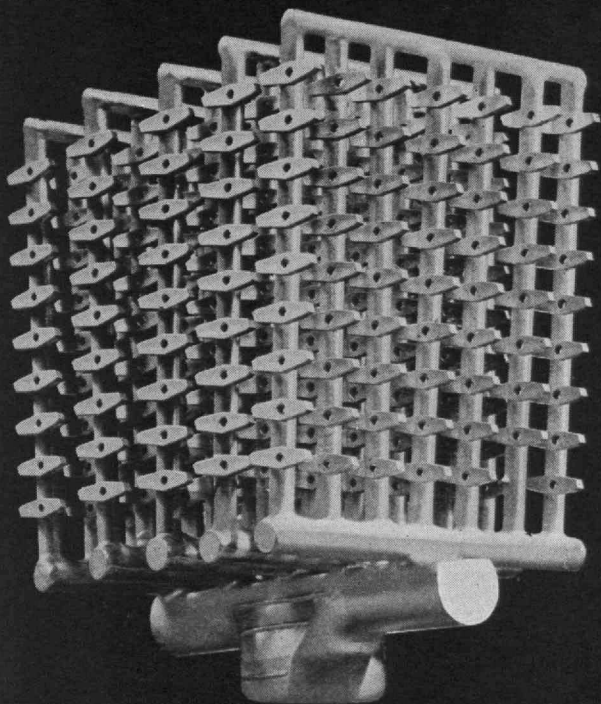
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Alfred T. Glassett '20, Vice President

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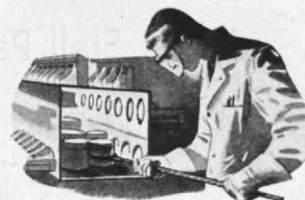


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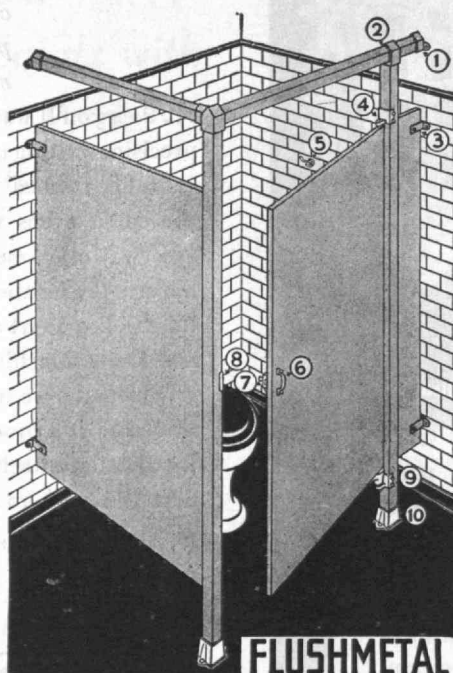
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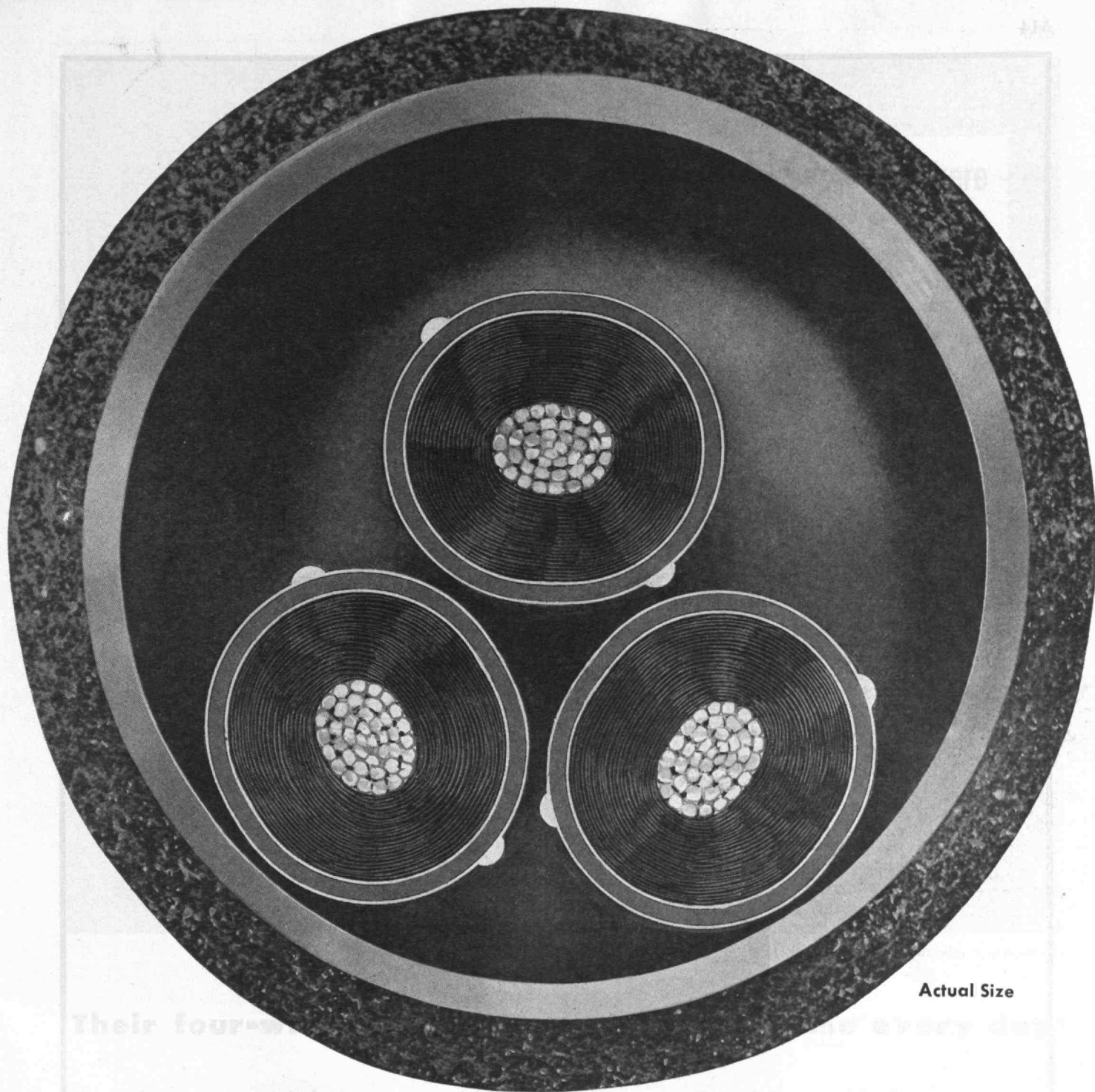
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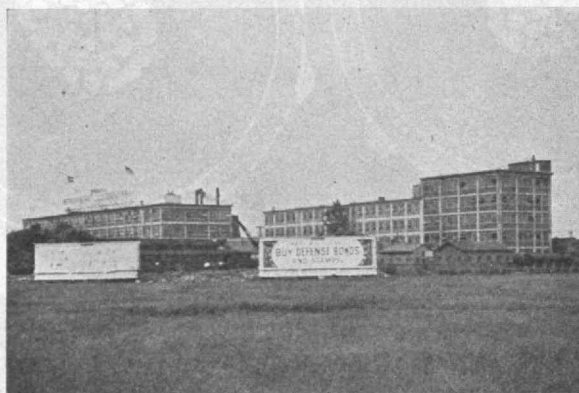
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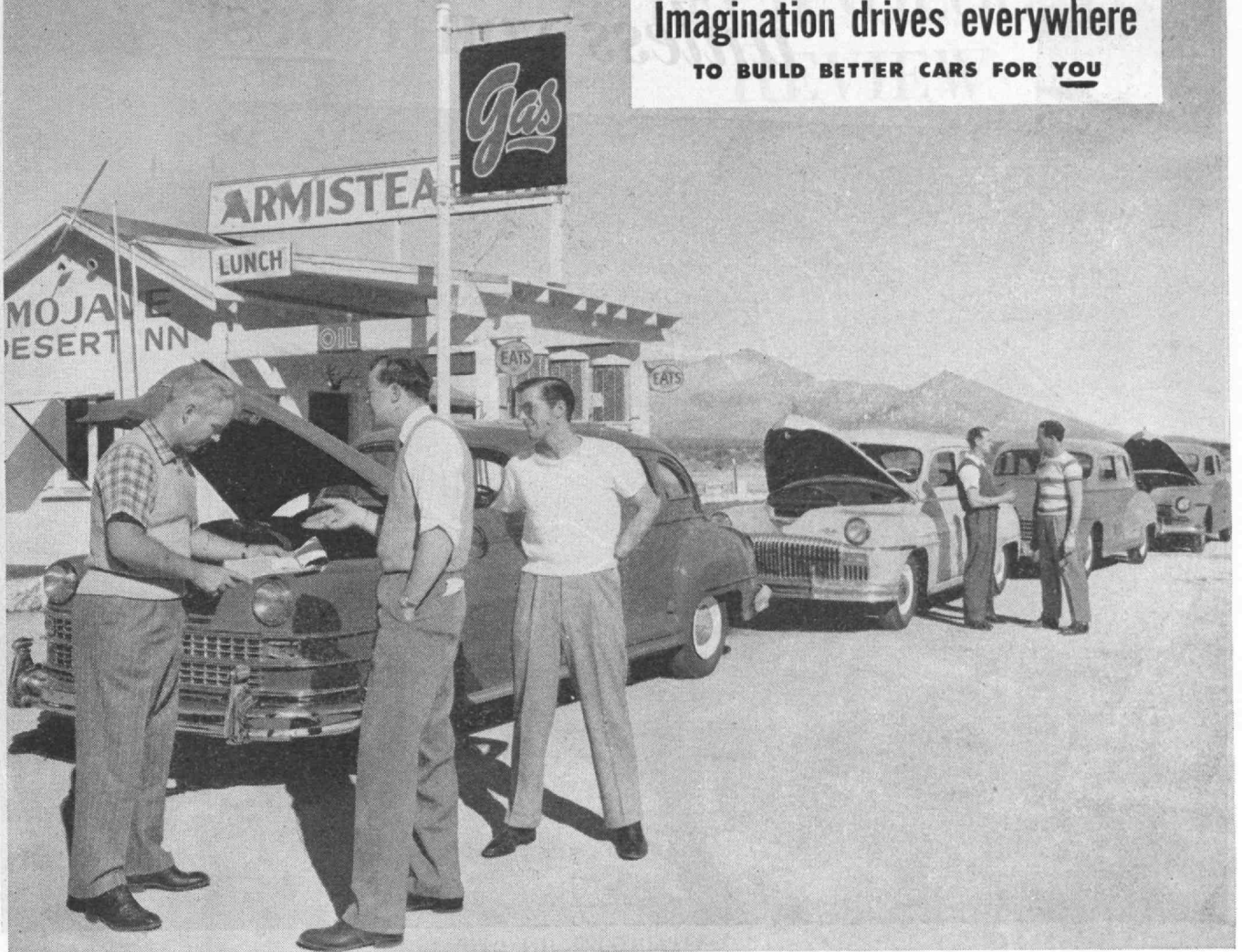
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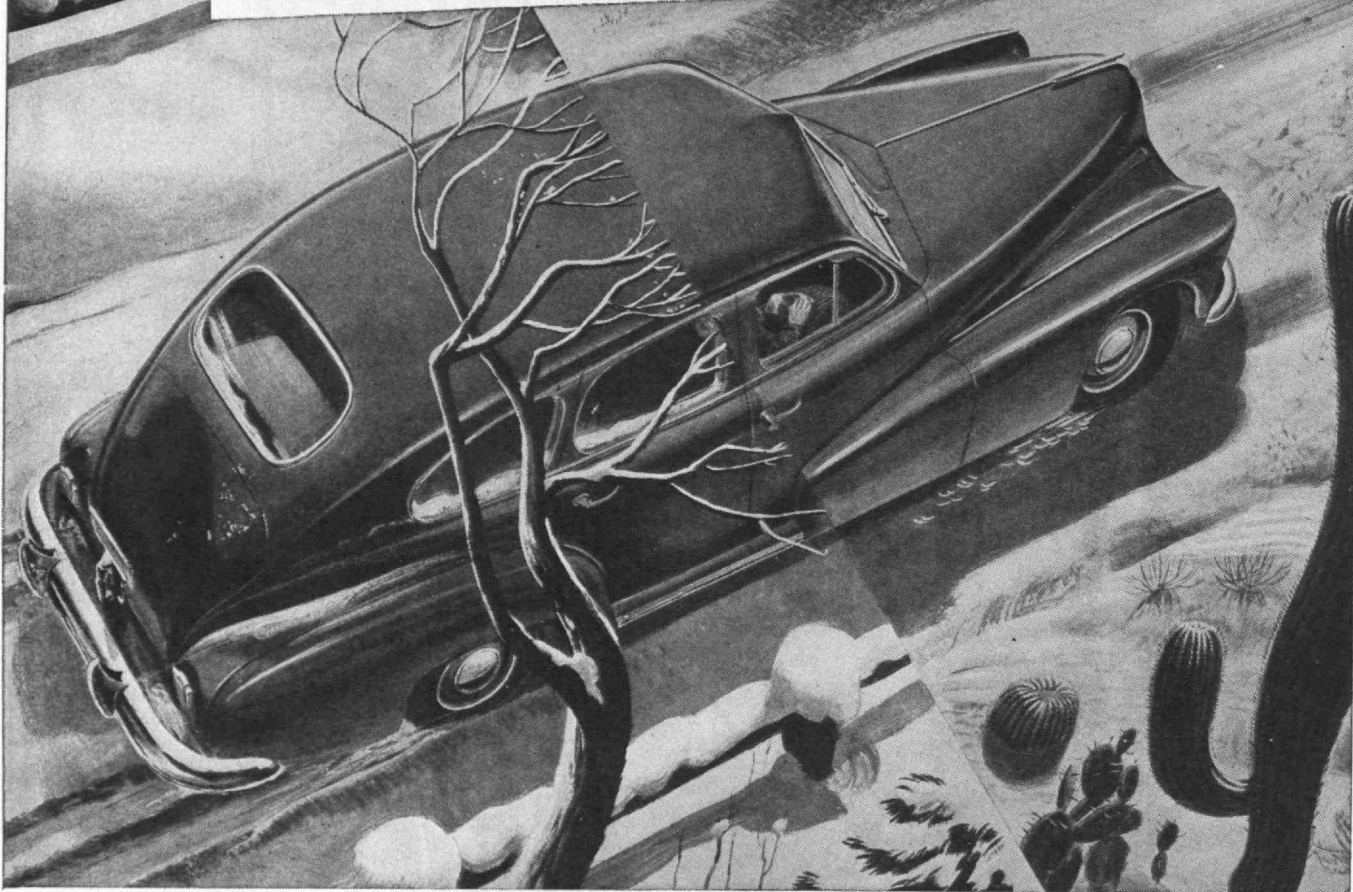
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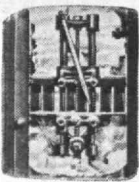
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CONTENTS for JULY, 1947

THE COVER — TWENTIETH-CENTURY CLIPPER

From a photograph by Harold M. Lambert

READY FOR TAKE-OFF	FRONTISPIECE	518
FIRST NIGHT FLIGHT	BY FRED C. KELLY	521
RESEARCH FOR NATIONAL DEFENSE	BY GEORGE C. KENNEY	523
<i>Scientific Pioneering Is Basic to Our Security and World Leadership</i>		
AIR TRANSPORTATION — TODAY AND TOMORROW	BY JOHN C. LESLIE	525
<i>The Nation Needs a Strong Commercial Air-transport System</i>		
FUTURE OF GAS TURBINES IN AIRCRAFT	BY ARTHUR E. RAYMOND	527
<i>Much Research Still Required to Develop Practical Jet Propulsion</i>		
PROBLEMS OF MANAGEMENT IN THE ATOMIC ENERGY COMMISSION	BY CARROLL L. WILSON	529
<i>Peacetime Applications of Nuclear Science Travel an Uncharted Course</i>		
ADDRESS TO THE GRADUATES	BY KARL T. COMPTON	531
<i>Objective, Analytical Thinking Required of Tomorrow's Leaders</i>		
COMMENCEMENT OF THE UNITED NATIONS	BY WARREN R. AUSTIN	533
<i>Encouraging Progress toward Peace Achieved in Last Two Years</i>		

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THE TABULAR VIEW	504
<i>Contributors and Contributions</i>	
INDEX TO ADVERTISERS	508
THE TREND OF AFFAIRS	519
<i>News of Science and Engineering</i>	
ALUMNI DAY ACTIVITIES	537
<i>Concerning Reunions and Commencement</i>	
THE INSTITUTE GAZETTE	541
<i>Relating to the Massachusetts Institute of Technology</i>	

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"The lesson here is to keep ahead . . . in technical development of aviation"

Symposium address by General George C. Kenney, '11

THE TECHNOLOGY REVIEW

Vol. 49, No. 9



July, 1947

The Trend of Affairs

Science in the News

FIRST synthesis of a substance with general structural characteristics identical with those of fibrous proteins, the fundamental units of which all forms of animal life are constructed, has been announced by Robert B. Woodward, '36, Associate Professor of Chemistry at Harvard. The new synthetic molecules are at least as long, and probably longer, than any ever made, and can be produced in thin transparent sheets and thread form. This leads Dr. Woodward to believe that the process for constructing this new class of molecules opens new fields of plastics potentially as useful as cellulose, nylons, silicones, vinyls, phenolics, and bunas.

The new synthesis is especially significant in medicine because it may provide a model for the processes by which the body synthesizes proteins, and may make possible synthetic silk, wool, and fur which are identical in every respect to, and not merely substitutes resembling, the animal-made products. Additionally, it is significant in that it opens the way for the production of molecules heavier than those of virus proteins which, so far, have held the molecular heavyweight championship. The molecular chains already present in natural proteins may be artificially lengthened through the process, with the promise that virus proteins may be modified into harmless organic substances, or that harmful pathogenic bacteria may be rendered harmless or their growth blocked.

The thesis of Dr. Robley D. Evans, Professor of Physics at M.I.T., that atomic studies are responsible for saving more lives than were snuffed out at Hiroshima and Nagasaki (The Technology Review, December, 1946), was emphasized by Drs. George E. Burch and Paul Reaser of the Tulane Medical School in a paper presented before the centennial meeting of the American Medical Association. Their studies show that radioactive sodium atoms, produced in the atomic energy pile at Oak Ridge, Tenn., have thrown light on a fundamental mechanism in congestive heart failure.

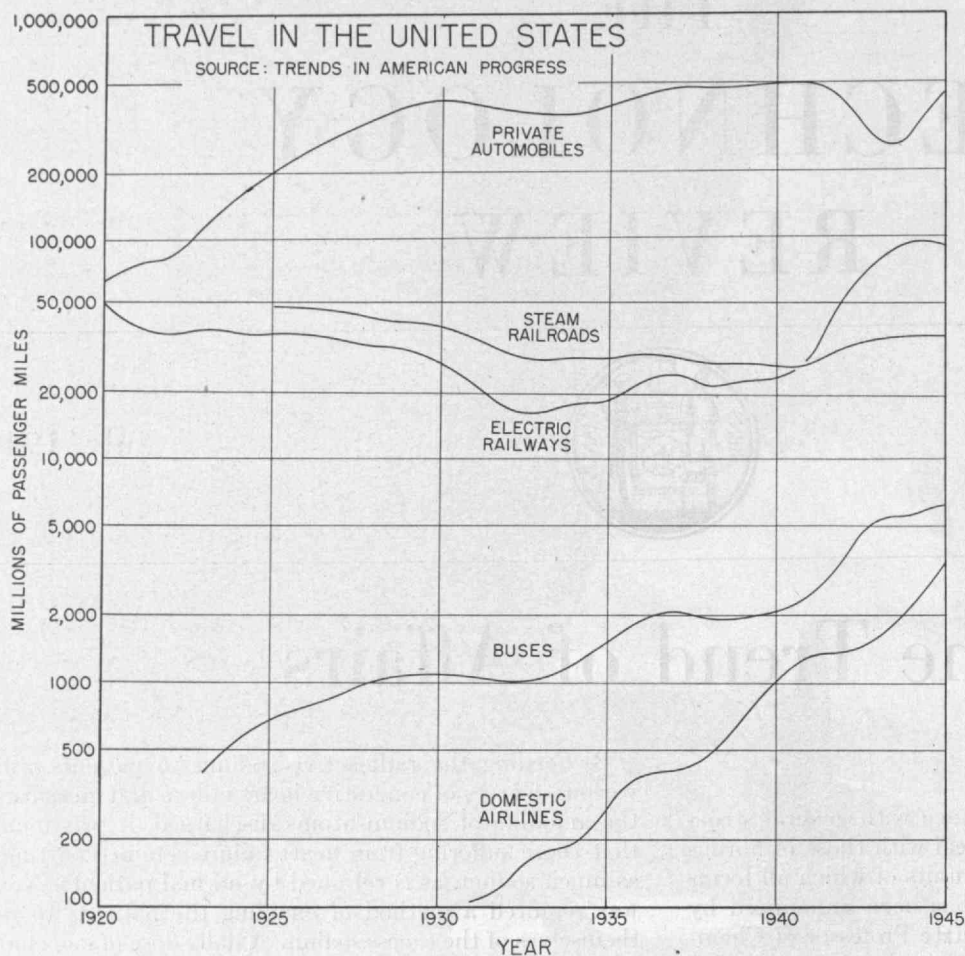
By feeding the radioactive sodium to patients with various degrees of congestive heart failure and measuring the amounts of sodium atoms discharged, it was found that those suffering from heart failure retained 50 times as much sodium as is retained by normal patients. Next was required a method of enabling the patients to rid themselves of the excess sodium. A daily dose of one cubic centimeter of mercurial diuretic, which stimulates urinary secretion, led to the elimination of the sodium tracer atoms and also the condition of congestive heart failure.

Turning from medicine to the field of remote control, evidence was recently presented that much progress has been made since some of the first serious large-scale attempts at radio control were made after World War I. A four-engined Army transport plane made a nonstop flight from Long Beach, Calif., to the Clinton County (Ohio) Airfield on June 11, making the 2,000-mile journey in eight hours and 46 minutes. From the take-off to landing, no human hand touched the controls in the longest "pushbutton" flight on record. Aside from this, nothing unusual happened from take-off to touchdown.

Bell-bottom Screw Jacks

THE announcement that the National Bureau of Standards has issued a revision of the simplified practice recommendation for bell-bottom screw jacks will undoubtedly be greeted with limited enthusiasm. That portion of our population which is intimately concerned with bell-bottom screw jacks appears to be quite circumscribed. But the movement of which this incident is a part cannot be dismissed so summarily. The trend toward standardization and simplification, which is affecting an increasing number of components and methods in our industrial civilization, and which extends occasionally into the sphere of international relations, is one of the more encouraging aspects of our times.

A round of international conferences involving Canada, Great Britain, and the United States has recently gone a



Prophecy is always a difficult and uncertain pastime. Nevertheless, if the present rates of growth of travel are maintained, travel by domestic air lines may be expected to exceed bus travel about 1948. With the same assumption, domestic air lines may be expected to carry as much traffic, about 1956, as electric railways now carry, and, by 1960, domestic air lines may carry as many passengers as are now transported by steam railroads.

long way toward making thread forms and pitches uniform through most of the English-speaking countries. In the matter of fine instrument threads, the Swiss are also being consulted. Even the metric system is not an unbridgeable barrier, for 16-millimeter film and certain metric dimensioned ball bearings are among the relatively few items which are standard on a world basis. The need for international standards was brought out emphatically during the war, when superficially similar designs were found not to be interchangeable and were far more difficult to maintain because of differences in such apparently minor items as threads, tolerances, and methods of assembly. The monetary losses associated with these discrepancies and with differences in the preparation and interpretation of drawings are estimated to have run into the hundreds of millions of dollars.

With all the work that has been done to reduce variations in the more common components used in industry and the home since World War I, it would seem difficult to find more items to standardize, yet activity in this direction is increasing. The field has a publication, *Industrial Standardization and Commercial Standards Monthly*, and a course on this subject has been started at Columbia University.

Efforts are being made to put foreign trade statistics on a truly comparable basis. At first glance it may not seem very important that to most Latin American coun-

With so much emphasis on the theme of the Alumni Day symposium, "Aviation—Today and Tomorrow," there appears to be little need to look into the history of aviation. And yet, the past proclaims the future, and therefore such a retrospective examination is not without its merit.

The trends in passenger travel in the United States for the past quarter century are portrayed in the graph at the left. As might have been expected, backbone of major travel in this country is the private automobile, accounting for almost half a billion passenger-miles of travel per year. Compensation for the recent slump in automobile travel is made by a corresponding increase in travel on steam railroads and electric railways during World War II.

The comparatively stable long-term trend of growth for steam railroads and electric railways is thrown into sharp relief by the substantial growth of passenger travel on buses and particularly in air liners. Although air lines still account for the smallest number of passenger-miles of travel, during the past 14 years, commercial aviation has shown a trend growth of something like 22 per cent increase per year — substantially greater than that for any of the other services over the same period.

tries soap is soap, whereas to the customs men of Mexico there are 11 classes of this substance, but analysts can become confused when imports of textiles are measured by yards in one country and by weight in another, or when classifications differ in meaning. A suit which is size 36 in the United States is size 47 in Belgium, size 38 in France, and size 4 in Ireland. A size 37 collar on a shirt calls for no comment in Europe; the measurement is in centimeters. Spark plugs, which were partially standardized early in the century, have been rather badly unstandardized by technical advances. This is a common cause for the continual revision of standards. For the vast majority of industrial items there is no compulsion to use standard parts. The specifications are arrived at by common consent and are adhered to because it is generally immensely profitable and timesaving to do so. But if a designer encounters a good reason to make a new version of a previously standard item, there is nothing but economics and sound engineering practice to stop him. In the case of spark plugs, standards set up several decades ago could not serve for new engine designs, new fuels, and the airplane. With the world's production of automobiles and planes dominated by American practices and mechanisms, there is now a need for international agreement on sizes and types.

Although some standards, such as the cubit, are quite ancient, the large-scale creation of standards by orderly,

conscious, and voluntary action is a phenomenon of the 20th Century. Most of the national standardizing bodies (there were more than a score in 1939) were set up during or after World War I. The oldest group of this type is the British Standards Institution, which was set up in 1901. The great incentive behind standardization is that it frees effort for more productive purposes than making minor decisions in fields where similar decisions have already been made countless times before. Without standardization, complexity would degenerate into chaos.

First Night Flight

BY FRED C. KELLY

WITH their cities devastated by night bombers, one wonders how many Germans remember that the first flight of an airplane after dark was made in Germany. This epochal event occurred toward the end of September, 1909, at the Dormstedt military parade ground near Potsdam. A young man had been demonstrating the first airplane ever seen in Germany. He hoped that it would prove to be an instrument to prevent war; that the threat of bombs on buildings housing any government that declared war, would put an end to wars. The German Kaiser, an interested witness at some of the flights, may have had different ideas; certainly one of his successors did.

One evening the young pilot stayed in the air so long that he found himself in darkness when ready to land. The crowd of spectators sensed that darkness had come more quickly than the pilot had realized. The Germans, not yet corrupted by Nazi ideas, were a courteous and considerate people. As if by common impulse everyone who had an automobile turned the headlights toward the landing area, and the young flyer landed safely without mishap. The name of the flyer was Orville Wright.

New models of aircraft are announced annually; each better in several respects than its predecessor. Each, in turn, merits and enjoys a more or less prominent place in the annals of aviation but is ultimately replaced by a newer and better successor.

Patriarch of today's fleet of sky ships is the Wright Brothers' biplane enshrined at Philadelphia's Franklin Institute. Pressurized cabins, instrument landing, and ground-controlled, approach radar systems were to be unknown for decades after this plane first soared into the air under its own power. But age rests lightly on this structure of bicycle parts and wooden struts reputed to be the oldest plane still in flying condition

Piper's Fancy

PIPE installations in any manufacturing plant must be strong mechanically, and must resist corrosion. In food manufacturing, equally important necessities are sanitary construction and adaptability to easy cleaning. A secondary requirement for many installations is some means of identifying the contents of each pipe.

In the past, pipe made of borosilicate glass, sold under the trade name Pyrex, has found some use in manufacturing, because it meets ideally most of the requirements just outlined. Its corrosion resistance exceeds that of any available metal piping. Sanitation is easy because macroscopic dirt within the pipe is visible, because cleaning operations may be watched directly through the pipe, and because glass piping is readily made with sanitary demountable fittings. Identification of contents is axiomatic, since anything inside the pipe is directly visible.

Then why has glass piping not found wider use? Custom and earlier industrial practices provide some of the answers to this query. Plant engineers are accustomed to doing pipe fitting on the spot, with a bench at hand to cut, thread, and join pipe to fit the situation, whereas, on the other hand, until recently, glass piping had to be obtained in prefabricated shapes and sizes which were made in advance by the pipe supplier from exact and detailed drawings submitted by the user. This practice not only hampered new installations of glass pipe, but also limited flexibility in altering installations to follow seasonal changes (common in the food field), to improve manufacturing procedure, or to permit emergency adjustments. Ordinary soda-glass tubing has long been fabricated in laboratories, but the procedures there used are not adaptable to assembly of glass piping for industrial use, both because of the toughness and high-melting point of the borosilicate glass, and because of the large diameters of much of the piping.

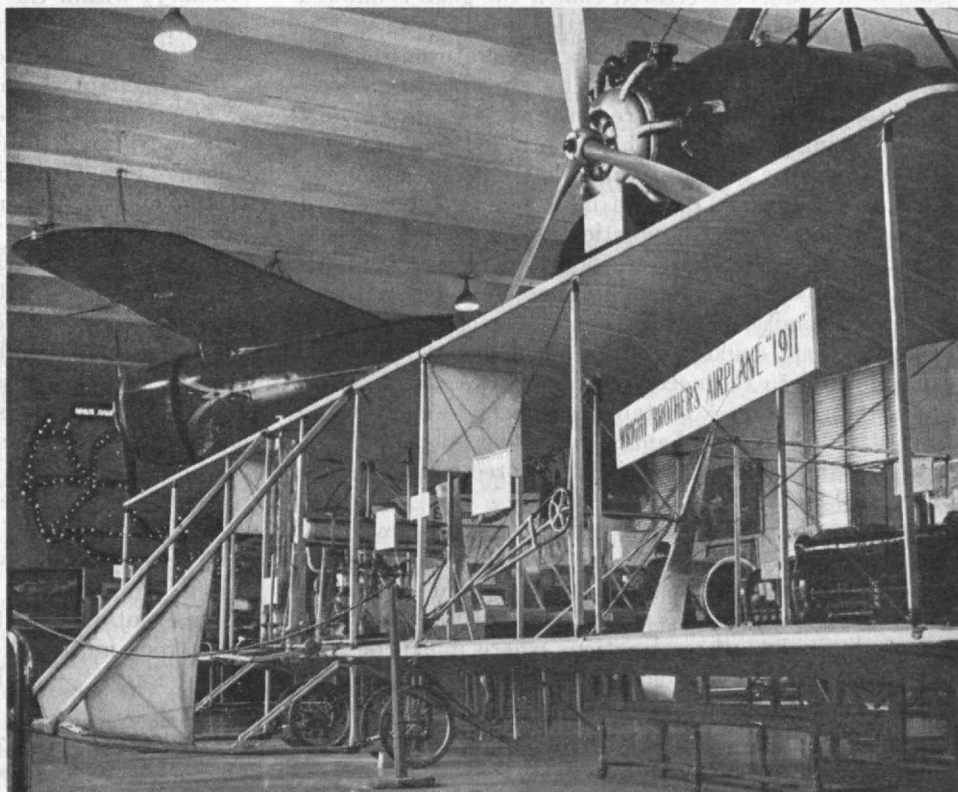


Photo by Chester from Black Star

These obstacles to on-the-spot fitting of borosilicate glass pipe were overcome during the installation of seven and a half miles of glass pipe, in sizes up to four inches diameter, in the plant at Oak Ridge, Tenn., where U-235 was made for atomic bombs. Special devices and procedures were developed for cutting, forming, welding, and annealing, with all of these operations performed on portable benches, comparable to the conventional pipe fitter's bench.

Cutting was accomplished by localized application of heat from a resistance wire carrying an electric current. The glass was scratched with a file at the point where the cut was to be made. A single turn of Nichrome wire was then applied tightly around the pipe at this point, and current controlled by an autotransformer was passed through the wire. After sufficient heat was generated, the wire was removed and a wet cloth applied to the pipe. The consequent sudden cooling of the locally heated pipe caused a strain that snapped the pipe cleanly at the scratch mark.

Forming and welding of borosilicate glass in large sizes are hampered by the fact that even at the temperature of the oxyhydrogen flame, this glass cannot readily be brought to its melting point without localized overheating. At Oak Ridge this difficulty was overcome by taking advantage of the electrical conductivity of glass at high temperatures. Two opposing oxyhydrogen flames were used, with the terminals of a high-frequency oscillator connected to the burners. After the glass was sufficiently heated by the flames, the high-frequency current was turned on, and this current passed through the flames and flowed through the glass. Because of the resistance of the glass, it was quickly and uniformly raised to its melting point.

The third and final obstacle that had to be surmounted in on-the-spot glass pipe fitting was provision of some means for annealing. In the heat-forming and welding of glass such strains are created that if the glass is allowed to cool freely it is extremely brittle, or may even shatter spontaneously as it reaches room temperature. Removal of such strains is accomplished by an annealing operation in which the temperature of the glass is raised almost to its melting point, after which controlled cooling lowers the temperature uniformly and slowly. Conventionally, annealing of glass is done in large permanent ovens, a procedure obviously impractical in on-the-spot glass pipe fitting. At Oak Ridge, portable electric furnaces were developed for annealing. These furnaces were essentially cylindrical jackets, containing electric heating elements, that could be closed around the fabricated pipes, heated to the necessary temperature, and cooled at the desired rate. A portable polariscope was provided to verify effectiveness of annealing; under polarized light, strains in glass show up as brightly colored bands or areas of spectral hue.

Ingenious and useful as are these recently developed techniques, still they do not yet make borosilicate glass ideally suited for all industrial uses. Even the tough borosilicate glass is not as strong as metal. Its use, therefore, is limited to those locations where it can be protected from mechanical blows or stresses, and even from severe vibration. But substitution of transparent tubing for its stronger metal counterpart has advanced far beyond the stage of being a mere pipe dream.

Sky Fire

THE 1946 publication, *Fire and the Air War*,* "a compilation of expert observations on fires of the war set by incendiaries and the atomic bombs, wartime fire fighting, and the work of the fire protection engineers who helped plan the destruction of enemy cities and industrial plants," is of immediate importance to city planners and military strategists, and will interest a widely diversified group which includes members of fire departments and sociologists studying the behavior of people under the stress of danger and disaster.

A strong air force can deliver fire wherever it wishes, and by means of this fire can accomplish — what artillery cannot bring about, what has not been possible in earlier wars — the destruction of the civilian property of the enemy in places far removed from military operations. World War II has demonstrated that the destruction of the enemy's civilian property is a most effective way of procuring a military victory, and it has shown that fire whether from incendiaries or from atomic bombs is far more efficient than explosives as a means of doing it.

The present book describes the measures which the civilian populations of Britain, of Germany, and of Japan took during the war to protect themselves against fire and to deal with it when it was rained upon them, and describes the frightful damage which it caused to persons and to property.

Approximately four-fifths of all the war damage done to English and German cities was the result of fire. The pre-atomic bombings of Japanese cities were fire raids. It has been estimated that the physical damage caused by the atomic bomb at Hiroshima was about the same as would have been caused by 1,300 tons of other bombs (one-fourth high explosive and three-fourths incendiary) within the target area, and at Nagasaki by about 600 tons (three-fourths high explosive and one-fourth incendiary) within the target area. To complete the estimate, additional antipersonnel fragmentation bombs must be included to account for the casualties.

The 15 chapters which comprise the book are the work of nine experts, among them the Chief of Fire Staff, British National Fire Service, the Chief Fire Marshal, Chicago Fire Department, and the anonymous author of the Official Report of the United States Strategic Bombing Survey on "The Effect of Atomic Bombs on Hiroshima and Nagasaki." This report constitutes Chapter 14, pages 194-240. Its author, after discussing the various means of protection which may be employed against atomic bombs, concludes that: "One further measure of safety must accompany the others. To avoid destruction, the surest way is to avoid war." The last paragraph of Chapter 15 is also the last paragraph of the book the purport of which it summarizes as follows:

"World War II demonstrated that planned destruction of large areas of cities could be accomplished. The destruction is easier with the atomic bombs. The greater the fire vulnerability the more certain enormous loss of life in event of such attacks. He who would make his nation strong must look to its fire defenses as well as to its armed forces." — T. L. D.

* Boston: National Fire Protection Association International, 1946. xii + 262 pages. \$4.00. Edited by Horatio L. Bond, '23, Chief Engineer, National Fire Protection Association.

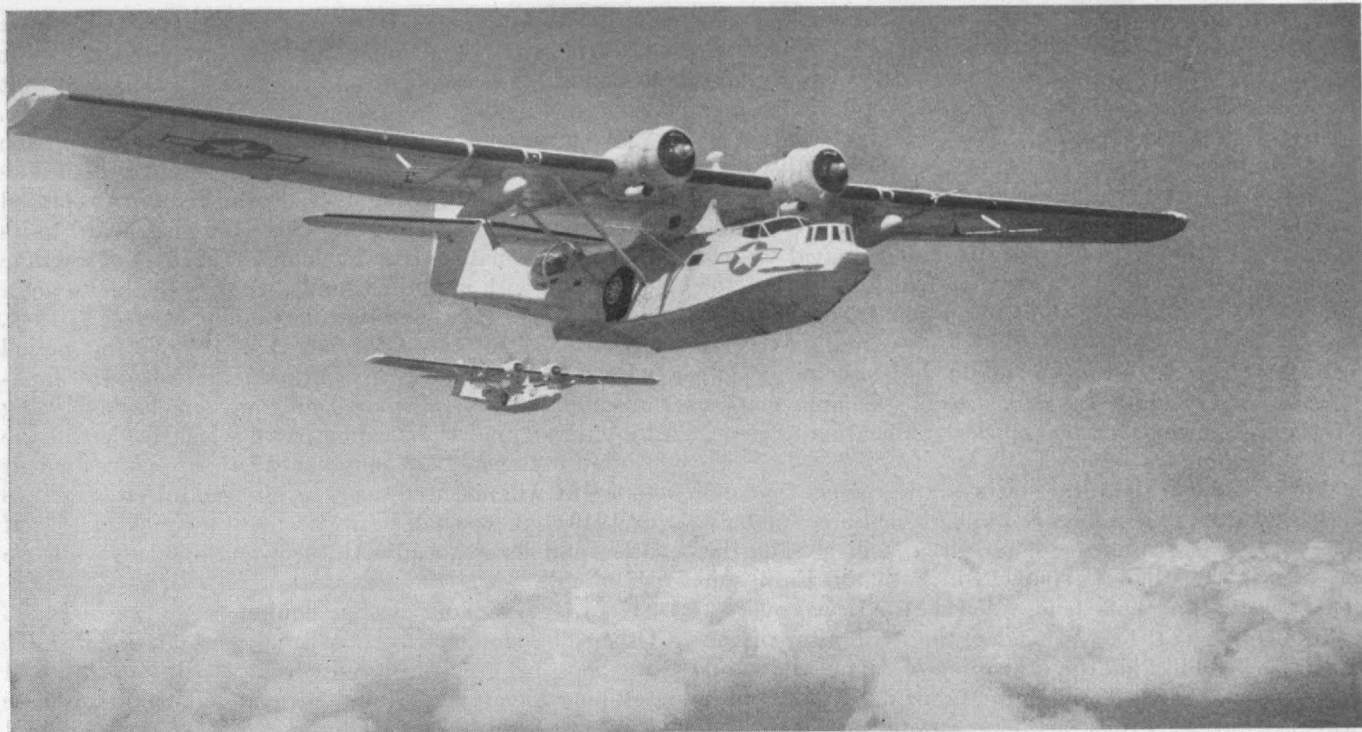


Photo by Harold M. Lambert

Research for National Defense

*Scientific Research, Actively Pursued, Plays a Double Role.
It Is Desirable in Raising Our Standards of Comfort;
It Is Imperative for Our National Security*

BY GEORGE C. KENNEY

AT the conclusion of any operation, whether it be the building of a bridge, manufacturing 1947 model automobiles, or fighting a war, it has become standard procedure to sit down and study the reports, analyze the events that occurred, see what mistakes were made, why they were made, and how much they cost. From this analysis we are supposed to find out how to do the job better next time. In the case of the bridge builder and the automobile manufacturer, the scheme works quite well. The bridge builder keeps right on building bridges and the automobile manufacturer starts on his 1948 model as soon as he has finished with the 1947 line. The conditions of the problem do not change much from one operation to the other.

In warfare, on the other hand, a period of perhaps 20 years elapses between wars. New weapons are developed which in turn influence tactics and strategy and even dictate the location of battles and campaigns. If military men do not keep abreast of such developments and correctly evaluate their influence, they are liable to be accused of trying to fight the last war instead of the present one. The losers in most wars, as a matter of fact, have done this very thing. Napoleon defeated many generals who were still thinking in the past. In World War I, the stalemate and the continual slugging match that won or lost a few yards of ground, can be attributed to

the fact that both sides were merely continuing their previous wars. The blitz warfare of the second World War, with its use of air power and mechanized forces, smashing through the strongest defensive positions and quickly gaining the decision, almost gave Germany world dominion. Hitler was finally defeated only after the Allies had learned how to "out-blitz" him.

After six years of struggle and the subsequent analysis of events, there are certain definite conclusions that we can make. Certain methods and weapons should be further developed, others should be modified to meet changed conditions, and still others should be discarded as obsolete and on which it is no longer worth spending our national defense appropriations.

Air power has become the decisive element in warfare. The conflict is opened by air power and the first action is an air action. Air power is the only means of defense against air attack and the battle for control of the air must be settled before the surface forces of the winner can get under way. In fact, the winning of the air battle has become so decisive that in the future the role of surface forces may very well be that of mopping up die-hard detachments and guerrillas and completing the victory by occupation and administration of the enemy country. Today the world is at the mercy of the airplane.

Air-borne operations, with the flying of troops, sup-

plies, and reinforcements to the scene of operations and the evacuation of casualties, will bring us up to date on an age-old basic principle of war illustrated so picturesquely by General Nathan Forrest when he said: "Git thar fustest with the mostest."

Our analysis of past battles and campaigns, however, must be more than cultural. To analyze Pearl Harbor simply as a "sneak attack" would be wrong. To conclude simply that aircraft could sink or damage naval vessels would be insufficient. Actually, we had known that for years. The real lesson was that our national defense organization was wrong. We had plenty of warning. We had enough fighter defense to defeat the Japanese air attack. We had everything necessary except the appreciation of what air power could do and the organization to insure that something was done.

We are now in the throes of trying to correct that defect by unifying the Army, Navy, and Air Forces under a single head. As a matter of fact, that will give us the organization we had to come to in both the European Theater and the Pacific before World War II was over.

In February, 1945, Corregidor, the "Gibraltar of the East," stood blocking the utilization of Manila Bay and the docks and harbor facilities of Manila itself. Corregidor was bristling with coast artillery, antiaircraft guns, and machine-gun positions. It had ample supplies of food and ammunition and was manned by a garrison of approximately 8,000 fanatical soldiers ordered to stay there and hold the position at all costs for the glory of the Emperor and Greater East Asia. Four thousand tons of heavy bombs, dropped in 10 days, reduced the defenses to rubble. A parachute regiment of 1,800 men descended on the parade ground on the western end of the rock and 2,000 more men rowed across the harbor entrance from Bataan and landed on the beach. A few scattered rifle shots were fired and Corregidor was again American territory. Mopping-up operations to dig the Japanese survivors of the bombardment out of their caves took a little longer but the so-called impregnable fortress had fallen to the bomb carried by aircraft.

Looking to the Next Decade

The lesson went beyond the facts that this operation was brilliantly executed and that it was successful. It settled for all time the question as to whether or not we should spend our national defense appropriation on fortresses. It sounded the death knell of the fortress.

An analysis of World War II also brings out the tremendous advantage that superior equipment carries with it. With anywhere near equal forces, that force with the superior equipment wins. This was particularly true in aviation. Neither the Germans nor the Japanese could match our bombers. American bombers had more range, carried bigger bomb loads, were faster and were better defended than anything produced by our enemies. While at times both the Germans and the Japanese produced fighter aircraft that excelled ours in some particular characteristic, ours had more range, better bullet-proof tanks, better armor, more structural strength, and were better all-around combat weapons. The record of victories bears this out in both theaters.

The lesson here is to keep ahead of any possible enemy in technical development of aviation. If we maintain a lead in technical development of aviation, we will have gone a long way toward insuring that we win the air bat-

tle in any future war. If we win the air battle, we cannot lose the war. In planning for that air battle we must visualize the weapons we and the enemy will have at that time and modify our tactics and strategy accordingly.

We must constantly look ahead five to ten years. Nine years from the time we began planning for an airplane like the B-29, it began flying over Japan. Five years elapsed from the time the B-29 was on the drawing board to its first operational mission. Even under the drive of wartime effort and with unlimited funds, we were unable to get a new airplane into operation between December 7, 1941, and August 14, 1945. We fought that whole war period with aircraft types already in production when the Japanese hit us at Pearl Harbor. Today, we must be developing the aircraft and the weapons with which to defend the United States in 1952 and 1956. If we stop development today we will not necessarily be plunged into war in 1948 or 1949, but we shall be wide open to attack in 1952 if other nations go ahead with their developments while we stand still.

In a few years our existing equipment will be obsolete. Others, besides ourselves, will have atomic bombs. Jet and possibly rocket-driven aircraft will be standard equipment everywhere for air combat and bombing. There seems to be no practical limit in sight for speeds and ranges, particularly if atomic energy power plants are developed for aircraft. The time elapsing between the decision by some future aggressor to attack us, and the actual attack itself, is rapidly becoming a matter of a few hours. Unless we can find a way of defeating that attack, or can show so devastating a power of retaliation that no one will dare to risk the consequences of war against us, we may suffer so appalling a casualty list in the first 24 hours that, coupled with the accompanying destruction of our industries, the nation may be unwilling to endure further punishment and decide on capitulation.

We need a warning service extending as far out from our centers of industry and population as possible. We need fighters, constantly on station to take off on receipt of warning that strange aircraft are headed in our direction, challenge such aircraft and force them down, or shoot them down, if they cannot identify themselves as friendly. We already do this with surface vessels. That is what we have the Coast Guard for. No ships steam into our harbors without getting the proper clearances before they leave their home ports. We shall have to do the same thing with aircraft.

Our primary insurance, however, will be our long-range striking force of bombers and their accompanying fighters capable of striking any target anywhere in the world at a moment's notice. This force should be capable of matching bomb tonnage with any possible enemy. No would-be Hitler of the future is going to attack us if we can not only defend ourselves, but by retaliatory action, can destroy him. No future aggressor would even hesitate to attack us if we are defenseless or cannot trade punches with him.

Tasks for Research

This brings us to the part to be played by science and industry, both of which you represent. We need a lot of things that only you can produce. I will mention a few as illustrations. There are many more, and the chemists, the physicists, and the engineers of the world are continually searching for the answers. (Continued on page 576)



Photo by Harold M. Lambert

Air Transportation — Today and Tomorrow

*A Healthy Air-transport System, Calling on International Ports,
Is Essential for Peaceful Commerce and an American
Electorate Conscious of World Affairs*

BY JOHN C. LESLIE

AIR transportation will be advanced to new heights of usefulness and prosperity through the work of the scientist and the engineer. The basic problems are still those of building safer, faster, and cheaper aircraft, of providing efficient airways and airports, and of fitting these machines to human capacity. This is what science and engineering can and will do. Great advances have been made since the early days of aviation, but they should not deceive us. Despite an impressive record of accomplishment, the future of aviation is greater than its past. Make no mistake about it. In absolute terms, air transportation is years removed from technical maturity.

Technical effort alone will not develop the full potential of the industry. Money has always been a problem, and is so now more than ever. Aeronautical research is becoming incredibly expensive. The price per unit weight of high-performance transport aircraft is constantly rising. Major sums of capital are required for the development of airways and airports. Under the American system, to which I am sure we all subscribe, an opportunity for reasonable profit in the aircraft manufacturing business and in the air-line business must exist if additional private capital is to be attracted to the job.

Beyond the financial problems are large areas where politics and diplomacy determine the progress of the air-line business. The air liner uniquely brings to govern-

ments, both local and national, mixed considerations of public convenience, commerce, prestige, national defense, and military power. The sword and the plowshare are sometimes almost indistinguishable in the transport airplane.

Only the soundest kind of long-range thinking and planning can tune these dynamic elements to the good of the public and the peace of the world. I do not presume to give you the tuning formula. By considering each of the principal factors, however, I hope to give you some added basis for interpreting — and shaping — the news.

Airplane Development

Progress in the past has depended on a tacit division of responsibility. The universities — with our own M.I.T. in the lead — have trained the engineers and have sustained the professors in their programs of pure research. The Government, through its civilian and military agencies, has done the major portion of research requiring large facilities. The armed forces, through contracts with private manufacturers, have developed virtually every large power plant. Private capital has taken the basic research and the military power plants and produced our air liners. This is a scheme well proved in practice. It would be folly to abandon it in favor of any plan which, in effect, would put under government control the produc-

tion of standardized aircraft types for sale to the air lines. The basic way to avoid this folly is to see that the air lines are kept in sound financial condition under honest, economic, and efficient management. It is equally essential that the Federal budget provide adequate funds for a consistent long-term program of military research.

The Air Liner Today

I dare say that many of you are not really familiar with today's air liners, for they are just now coming into service. I refer, of course, to the Douglas DC-6 and the newest Lockheed Constellation, both of which may be placed in the same general category. They are large, four-engined machines, carrying 50 to 60 passengers, cruising at from 300 to 325 miles per hour, and operating at maximum gross weights of from 90,000 to 100,000 pounds. They can fly with reasonable economy from London to New York with not more than one intermediate stop. Naturally, they have pressurized cabins to permit flight above the weather and to eliminate ear discomfort during descents. They provide many new niceties for comfort.

This year two new aircraft built for shorter ranges will undergo the qualifying tests of the Civil Aeronautics Administration, the Convair 240, and the Martin 303, both two-engined aircraft. They will carry about twice as many passengers, will weigh about 50 per cent more and will be from 100 to 120 miles per hour faster than the famous Douglas DC-3 they replace.

Finally, America will produce this year the big, new Boeing Stratocruiser, a transport development from the B-29 Superfortress. Cruising up to 340 miles per hour, its double decks will carry as many as 80 passengers on the long transcontinental and transoceanic routes.



Photo by Carl Berger from Black Star

Many families of moderate income would like to tour foreign lands at least once while their children are of teen age. Aviation now provides that opportunity.

I am sorry to say that is the end of the roster. The 400-mile-per-hour Republic Rainbow was in an advanced stage of construction when cancellation of a purchase contract by one of the air lines — a real tragedy for American aviation — brought the project to a halt. One must hope that some measures will be taken, perhaps involving both the armed forces and the commercial air lines, to get this project under way again. Few people realize the alarming fact that although certain foreign countries are pursuing definite programs for the construction of new air liners, there is not a single new commercial transport type on order in the United States today beyond those which I have mentioned as being scheduled for delivery this year. Failure to match foreign equipment was one of the reasons for the defeat of our merchant marine on the high seas when the sailing clippers were outmoded.

The Air Liner of Tomorrow

One cannot talk about the future air liner without fixing the importance of speed. Naturally, what the air lines have to offer the traveler is speed, but there is more involved than that. What air lines must also be able to offer is economy, or more plainly, low prices. A potential mass market exists, especially on the international routes. Think how many families of moderate income there are in this country who would like to take a trip at least once, when the children are of teen age, to Europe, or Rio, or Honolulu, but who simply cannot do so by steamship within the customary two-week business vacation period. By air, they could fly over on Friday night, spend two full weeks abroad, and come home the last week end, ready for work Monday morning. This would be the kind of traffic the air lines like best for it is created, not diverted, from other means of transport. For our nation such travel would build an electorate newly conscious of the world in which we live. The air lines need only reduce the price down to a level which the ordinary family can afford.

You may wonder why I raise the question of price here. The answer is that speed can have a lot to do with economy. Usually the effect of high speed is adverse, but not necessarily in the case of aircraft. The air liner's produce is passenger-miles (or ton-miles) per year. Many important elements of cost are primarily determined by the passage of time rather than mileage; for example, depreciation, flight crew salaries, and many aspects of maintenance cost. If such costs are fixed in relation to the calendar, it is plain that passenger costs per mile may decrease as the speed of the vehicle increases, provided the added speed comes from increased efficiency and not from "main strength and awkwardness."

Fortunately, the scientists and the engineers have been contributing the added efficiency. Probably the propeller-driven air liner approaches its efficient limit in the vicinity of 475 miles per hour. Now, however, we have at hand a new means of propulsion — the turbo-jet. Its efficiency becomes high at speeds in the vicinity of 450 miles per hour. I profess no expert knowledge, but I have not the slightest doubt that we shall all be riding in jet-propelled air liners at speeds of at least 500 miles per hour. When that comes to pass, I am sure there will be a further lowering of the price to the public. Incidentally, there are indications that the turbo-jet power plant will ultimately be cheaper to maintain (*Continued on page 570*)

Future of Gas Turbines in Aircraft

*Much Research Is Needed to Surmount Present Limitations
but the Gas Turbine Has a Promising Future for
Use in Tomorrow's Aircraft*

BY ARTHUR E. RAYMOND

AT a time when so much research is being undertaken on the development of new gas turbines, it is natural to ask: "What are we going to use gas turbines for?" My experience outside the aircraft field is meager, but within that field it is possible to visualize a great future for these new sources of motive power.

Gas turbines, as I would define them, comprise that class of engines in which, after compression and the addition of fuel, the hot gases act directly on a rotating member, rather than indirectly through reciprocating parts.

The energy of the products of combustion may be released through conversion to high velocity, as rockets make use of it, in which case we have the so-called jet engine, or turbo-jet. The hot gases may also be passed through additional turbine blades and transformed into mechanical energy to drive either a fan or a propeller, as in the ducted fan or in the propeller turbine, more commonly called the turbo-prop. In all these variants the initial cycle is the same. Even when a propeller is used, some of the energy of combustion is not recovered by the turbine and acts as a jet, so the jet is, in some measure, common to all.

Why are these engines supplanting the reciprocating types for so many of the products of aeronautical engineering and wherein lie their advantages and disadvantages?

First of these new engines to be used was the turbo-jet which made possible greater speed of aircraft. The turbo-jet was first employed in extremely fast interceptor aircraft because the jet engine is a device whose power and appetite for fuel change more favorably with speed and altitude than do those of its propeller-driving brothers. Thrust, or the force driving the airplane, remains more or less constant in jet-engine planes whereas it falls off almost directly with speed for propeller-driven airplanes. The decreasing temperatures at high altitude have much greater beneficial effects on the low temperature turbine cycle, than on that of the reciprocating engine where the maximum temperatures are high. Although the jet engine is light, this advantage is lost if it becomes necessary to carry along the fuel to operate it for a long time, for it is a notorious fuel eater. All things considered, it is ideal for the interceptor type of aircraft which has to get aloft in a hurry, pursue the other fellow, and make its kill.

Conversely, at low speeds the propeller engine delivers its greatest thrust and is more effective than the jet engine. Except in extremely high-powered airplanes, the use of jet engines implies the use of longer runways than would otherwise be required, or the use of catapulting devices as employed by the Navy. The pickup in speed after leaving the ground is slow in jet-propelled aircraft and it is difficult to eliminate the engine thrust com-

pletely during the landing operation. If the jet engine is slowed down materially, a greater than normal interval is required to get it up to power again. All in all, the jet airplane is a flashy thing in the air but on or near the ground, during take-off or landing, it acts as though the air were made of molasses.

One other thing is against it. For some reason, hidden in the recesses of the innermost secrets of combustion, the jet also has a disturbing tendency to quit altogether at certain speeds at high altitude. This is termed "blow out." Just how well a jet engine acts in this regard depends on a lot of things, such as temperature and whether the month has an "R" in it.

The deficiencies of the jet engine have led designers to clamor for the addition of a propeller. The turbine portion then becomes a relatively constant operating device and the thrust application is derived from the pitch change of the propeller, while additional thrust can still be obtained from the remaining jet blast. A propeller gives much more push at lower speeds and lower altitudes and it can be made into a very good brake as well. And so we have seen the development of the turbo-prop engine.

But the turbo-prop engine is not the answer to everything, either. Not only is the propeller, its controls, and its gearing an intricate piece of machinery but it loses efficiency if the speed is too high and it likes good thick air into which to bite. At high speed and high altitude, its efficiency drops until, as the speed of sound is reached, the propeller fails altogether. The propeller does help the jet engine in take-off and enables it to get lower fuel consumption per mile. For these reasons the turbo-prop engine has been used in long-range bombers and similar aircraft.

The good old reciprocating engine with propeller still leads the field in low fuel consumption and its manufacturers have a few tricks up their sleeves to increase its effective thrust per pound of weight. Also, a reciprocating engine lives to a much more venerable age than its newer turbine brothers and has to go to the hospital much less often. The most highly developed of the radial engines habitually go 1,000 hours between overhauls, whereas the turbo-jets do well to last 200, and the turbo-props — well, the less said about them right now, the better. A few years from now there may be a different story to tell. In the meantime, much research, much development, and much use of laboratory facilities will be required.

Superficially, it would appear that an engine in which all motions are continuous and smooth would last much longer and be easier to design than one in which important parts must reciprocate rapidly. This may be so eventually. Today, the requirement that parts rotate at high speeds while at high temperatures, and the necessity for the ut-



Photo by Harold M. Lambert

most in efficiency of each component, both combine to create a problem of enormous magnitude in design and materials. In addition, testing of the individual parts becomes difficult and extremely costly because of the tremendous amounts of power which are transmitted internally. People have been misled by the apparent simplicity of this type of engine; they are learning that its development requires just as much time and money as its supposedly more complicated predecessor. That turbine engines are so simple that they can be specifically tailored to each type of airplane, or perhaps to each model of airplane, is proving to be an illusory idea.

Nevertheless, performance counts and the gas turbine is bound to find extended application as time goes on. If the proper jet or propeller type is chosen for the particular use one has in mind, the gas turbine is one of the most efficient power plants available to man in terms of thrust produced relative to weight.

One word about commercial, rather than military, uses may be in order. The military applications should and will come first. Because the military services are more concerned with performance and less with safety than commercial services, they are far better able to pioneer in the development of gas turbine engines and aircraft. But in due course there will be jet transports. With them will come problems in civilian aviation arising from the special characteristics of jet-propelled planes.

The jet emerging from the tail pipe of a turbo-jet is hot and its velocity is high. While the airplane is being turned around on the ground under its own power, the jet cannot be blown at bystanders with the same nonchalance as the slip stream of the propeller. Very possibly, jet transports will have to depend on tractors or other ground-handling equipment to move them about amid other aircraft and in the vicinity of servicing or loading operations.

In flight, the jet transport will have to go direct to its destination and land in rather strict accordance with a

The military services are far better able than commercial aviation to pioneer in the development of jet-propelled aircraft. The coming of the jet transport will bring to civilian aviation new problems of design and traffic. The traffic control systems will have to be more universally used and will have to be much better than they now are.



Photo by H. Armstrong Roberts

previously outlined flight plan. It cannot move on to alternate landing fields in case the first one is closed in by weather, nor can it mill around in a stack with other airplanes waiting to land. To do so would impose a prohibitive weight of reserve fuel, for the fuel consumption per hour will be large even though it may be much less than it is now. Low speeds at low altitudes are not the proper environment for jet engines.

The greatest efficiency for jet-propelled aircraft will occur at altitudes higher than are common at present and a prematurely enforced descent will shorten its range and endanger its ability to travel the required distance. Therefore, pressure cabins will have to be designed to operate at higher pressures and they must be even more dependable than they are now. Operation over short distances will be comparatively expensive because there will not be enough time to ascend to the most efficient flying level and descend again. For the same reason a strong head wind aloft cannot be so easily circumvented by flying at a lower altitude.

To these operational problems will be added new and serious obstacles in landing and take-off. The presence of jet-propelled aircraft, entering or leaving the traffic pattern around an airport on a rapidly ascending or descending path and at a much higher rate of speed than the balance of aircraft, will introduce new traffic hazards. The problem is magnified by the practical requirement that when jet-propelled planes come down to land, they must be allowed to land almost (Continued on page 568)

Problems of Management in the Atomic Energy Commission

For Commercial Use as Well as for National Security There Is Need to Create an Atomic Industry

BY CARROLL L. WILSON

ALUMNI DAY BANQUET ADDRESS

THE atomic energy field is a big one; no one really knows yet how big it is. It stretches beyond geographical boundaries and beyond conventional horizons of national thinking. It combines major scientific problems with impressive problems in management and public policy. Solving these problems is not a task merely for scientists at Oak Ridge, Hanford, and Los Alamos, or for the small group of members of the Atomic Energy Commission in Washington. Nothing, short of understanding and wholehearted assistance from the entire nation, is going to assure that atomic energy makes its full contribution to national security and technological advance.

As M.I.T. Alumni, you already know something of the size of the problem. As a matter of fact, many of you have had close connection with the project. President Compton, as chairman of the Joint Chiefs of Staff's Evaluation Board on the Bikini Tests, knows probably as much as anyone about the military implications. Professor Robley D. Evans, in charge of the Institute's large program on the applications of radioisotopes to industry and medicine, has great familiarity with these peaceful applications of atomic energy. The Atomic Energy Commission and its staff include many M.I.T. men, such as Brigadier General James McCormack, '37, Director of the Commission's Division of Military Application, and Dr. James B. Fisk, '31, our Director of Research, for example. The Institute cannot fail to take pride in its outstanding contribution in this field—during and since World War II.

It is perhaps natural that I should discuss some of the problems of management in this unique enterprise which is a strange combination of government and private endeavor. Many, and perhaps most, of you have managerial responsibilities in your business activities. You have problems of production, of getting the materials you need, of providing fiscal controls, of working out wage and salary policies, of conducting research to keep ahead of your competitors, of selling your products or services, and last, but not least, problems of earning money. The framework in which you work is changing all the time, both as a consequence of what you and the rest of your industry do, and as a consequence of governmental action.

In managing the affairs of the Atomic Energy Commission we have most of the same problems as private enterprise and a great many more, but let me first describe some of the main elements of the business of the Commission. Under the 23-page Atomic Energy Act passed on August 1, 1946, after long and searching inquiry by the Congress, numerous aspects of atomic

energy are made a monopoly of the Government in the sense that the Government must control many activities and operations in this field. Responsibility for exercising such control on behalf of the Government is vested in the Atomic Energy Commission. Such control may be exercised through direct ownership and operation; through Government ownership but with operation by private contractors; through licenses and regulations, and by various other means. At the present time, the principal means through which the Commission exercises control is through ownership of materials, plants, and laboratories operated by private, industrial, or educational institutions under contract with the Commission. Through the devices of more than 300 contracts, the Commission operates facilities and carries on research and production in Government-owned properties representing a capital investment of nearly two billion dollars.

We may find that certain types of operations can be done more effectively if operated directly by the Commission. It is likely, however, that these may be the exceptions rather than the rule.

The Commission has a monopoly in the control, direction, and responsibility for atomic energy in the United States. But there is no monopoly in the sense that everything is done by and within Government organizations. In fact, this enterprise is a very large and complex manufacturing business, a vast research and development undertaking, a regulatory organization, and a body charged with the formulation of public policy in a new and unexplored field.

Operations of the Commission

The operating responsibilities of the Commission involve three general types of activity: (1) production of fissionable materials, isotopes, and weapons; (2) research and development directed toward increasing our rather meager knowledge in a field full of great potentialities which, when brought to fruition, may profoundly affect our daily lives, just as the military applications have already affected international relations; and (3) management of communities associated with certain major centers of production and research.

The Commission is responsible for manufacturing fissionable materials, isotopes, and weapons. In order to do this job, an intricate series of processing operations are involved. The first stage involves the procurement of special raw materials and their refinement to the form and purity required for the production operations at the plants at Oak Ridge, Tenn., and Hanford, Wash. One of the five major field offices of the Commission is responsible for the procurement and preparation of uranium feed

materials for Oak Ridge and Hanford. To be suitable for feed for the production plant at Oak Ridge, the uranium must be in a pure form of uranium hexafluoride. To be suitable for use at Hanford, uranium must be in a very pure metallic form. Thus, the first stage of an integrated manufacturing process involves preparation of these feed materials and their delivery on schedule to Oak Ridge and Hanford.

In the enormous plants at Oak Ridge, the second stage of production involves the separation of Uranium 235 from the normal isotope, Uranium 238. At the other production center at Hanford, Uranium 235 is burned as fuel to produce a new element, plutonium, which is also a fissionable material. The fissionable materials produced in the separation and burning operations at these two plants are useful both for reactors which, when much further developed, may be useful in the production of power, and for the production of atomic weapons. Thus, the first and second stages of this manufacturing process are the same whether the product is to be used in weapons or for peaceful purposes.

The manufacture of weapons, for which the Commission is also responsible, involves the third stage in the manufacture of fissionable materials. The same materials which are useful in weapons are also needed in research and development. At present, studies are under way to provide knowledge of the behavior of fissionable materials in reactors which now are capable of producing radioisotopes and will later be able to produce energy in a form useful for industrial uses.

The second operating responsibility of the Commission is to conduct research and development directed to the expansion of our very limited understanding of atomic energy. The development of new types of reactors, auxiliary processes and equipment, improved weapons, and better knowledge of the effects of radiations and therapeutic methods for treating those who have been exposed to these radiations are also subjects to which additional research is directed. This is a very broad assignment. While supporting, encouraging, and otherwise stimulating creative work to advance these frontiers, the Commission must be ever conscious of the dangers of too much control of research. A fine balance must be maintained.

The third operating responsibility of the Commission is to manage the communities established in connection with its manufacturing and research operations. At Oak Ridge, for example, there is a Government reservation of 60,000 acres on which has been built a city with housing and services for 40,000 people. The entire site and all buildings and facilities located on it belong to the Government, but the management services in the operation of the plants and the community are furnished by private contractors.

Atomic Energy Plants

In the eastern part of the State of Washington, on the Columbia River, the Commission owns or controls a reservation of nearly 600 square miles and a city with a population of 15,000 people. The weapons laboratory, requiring special features of topography and isolation, is near Santa Fé, N.M., and requires a community of nearly 8,000 people. In each of these communities there are all of the problems associated with city and town management and services, such as schools, public works, fire and police

departments, hospitals, recreation grounds, transportation systems, and a multitude of other services needed by any modern community. In addition, the Commission faces the problems of being the landlord and assumes responsibility for maintenance, rent collection, and other functions which go with owning and renting many thousands of dwelling units. Moreover, operations conducted at the Oak Ridge, Hanford, and Santa Fé plants require a measure of isolation. Despite such geographical isolation, if we are to advance our knowledge in this little-known field, it is essential to attract and hold personnel of the caliber required to operate the complex industrial plants in these communities, and staff the research laboratories in which creative scientific work must be done. For example, schools and medical services must meet high standards if scientists, engineers, and administrators are to leave large urban communities to live in the Commission's towns.

Embarking on an Uncharted Course

Another Commission responsibility, but not one involving direct operations, is interpretation of the Atomic Energy Act carrying with it the development of policy on innumerable questions. The Commission is responsible for the control of a vast body of restricted scientific and technical information related to atomic energy, as well as manufacturing knowledge and vital figures related to production and operations. A balance must be achieved between the declassification of information which would accelerate scientific and technical advancement, and the withholding of information which would benefit other nations at the expense of this nation's security.

By regulation and license the Commission must also control transactions involving certain special materials, including uranium and thorium. In addition, it must exercise export control of materials and equipment whose sale to other countries would advance their progress in this field. These controls should be so designed that they will impose the minimum necessary disruption on established commercial practices. The Commission must also administer provisions in the Atomic Energy Act regarding patents and inventions which are wholly novel and involve untried and unexplored administrative mechanisms and technical and economic appraisals.

The work of the Commission is done through about 300 prime contractors and a much larger number of subcontractors located in about 20 states. The employees of the Commission number about 5,000. The contractors' employees engaged on work under contract for the Commission number about 40,000.

In considering how best to manage this strange and complicated business, the Commission has concluded that it should develop to the fullest possible extent, a plan of decentralized administration. For the small staff in Washington (which is not expected to number more than 400) are reserved responsibilities for policy determination, program direction and authorization, and general coordination of this far-flung enterprise. The Commission operates within the framework of the Government, and, while certain broad powers are given to the Commission under the statute, the entire operation must be conducted in conformity with a large number of Federal statutes, regulations, and requirements in terms of fiscal, personnel, safety, and other procedures. (Continued on page 556)

Address to the Graduates

Real Accomplishment and the Satisfaction of Living Result in a Democracy When Leaders Resolve Difficulties through Objective, Analytical Thinking

BY KARL T. COMPTON

FAREWELL ADDRESS

AS each one of you received his diploma this morning there came to you a feeling of satisfaction — an inner glow kindled by this final public and official seal of recognition on the successful completion of that period of your life toward which have been pointed the plans, hopes, and sacrifices of your families and yourselves ever since you passed from childhood to youth. Now you pass from youth to manhood, to a period of increased responsibility, which you can enter with independence, confidence, and opportunity because of the background of education symbolized by these diplomas. For all this, I congratulate you.

But I congratulate you also because you are going out to take your places in a world full of difficult problems within the country and vexed with international complications. Perhaps this calls for explanation. Should I not rather offer you my sympathies, instead of my congratulations, on the difficulties which you will face? Let me give two or three reasons for the more optimistic view.

My first reason is that the greatest satisfactions in life come from surmounting difficulties. If there were no difficult problems there could be little real achievement.

One of my professors in college kept a quotation written on an upper corner of the blackboard in his classroom. It read: "The purpose of a liberal arts education is not to help you earn your daily bread, but to make each mouthful sweeter." At the time I thought this was a fine and noble idea, but the longer I have lived, the more I have become convinced that this quotation told only a part of the truth. It missed entirely the fact that the greatest part of the pleasure which each mouthful gives is derived from the satisfaction in having successfully earned it — is derived in the work of getting it.

Your satisfaction in your degrees today would be far less if they had been acquired easily. The slogan "Tech is Hell" is a favorite with our Alumni because it reminds them of many long hours of strenuous work, and they take pride in the fact that they met the challenge and did the job. No athletic contest lives in the memories of participants or spectators unless it was a tough one which called for every ounce of strength and skill.

Permit me to give an example from a recent personal experience. No assignment which I was ever given gave me such dismay as the appointment last winter to the President's Advisory Commission on Universal Training, and I could imagine few jobs which I could have undertaken with less relish. It interrupted other work in which I was far more interested. It could not possibly lead to conclusions which would be universally accepted, like a scientific argument which can at the end be labeled "Q.E.D.", meaning that every intelligent person would,

of necessity, have to accept the logic of the findings. I realized that whatever ideas I already had on the subject were not based on any exhaustive study or certain knowledge. I did not know most of my colleagues on the Commission, but knew that they had a very wide diversity of experience and viewpoint; and I wondered whether we could work together as a team or whether we would be disrupted by bickerings or preconceived opinions. I soon found that the other members of the Commission accepted the assignment with much these same reservations and misgivings. What happened?

Gradually the problem began to unfold before us as we studied one after another of its ramifications and as we attempted to gather, analyze, and evaluate the various facts and ideas submitted by thoughtful witnesses of wide diversity. From all this, our own various doubts and differences were gradually transformed into a conviction that a certain course ought to be pursued. Toward the end, when the picture began to take clear form in our minds, we began to feel a growing enthusiasm for the job; and when we finally handed the President our completed unanimous report and returned to our respective homes, it was with an intensity of relief and satisfaction that is impossible to express.

This episode illustrates, I think, how great may be the inner reward that comes from sustained effort to do a job, even though the job itself may have its disagreeable features. If, by good fortune, the job itself is in line with one's major interests, then the rewards are doubled. This should be true for most of you, as you now move into the various professional activities for which you have chosen to prepare yourselves. But whether you like any given assignment or not, do not forget that the greatest satisfactions in life come from the accomplishment of jobs that are not easy. Hence I congratulate you on the fact that you are graduating into a world full of problems.

Now let me approach the matter from a different angle.

Anthropologists tell us that the most virile and progressive peoples of the world are those who inhabit the temperate zone, and they offer an explanation. People living in the lush and lazy tropics find life too easy. With coconuts and breadfruit growing on the trees, with no need for protection against cold weather, there is no need for great ingenuity and perseverance to satisfy the primary requirement of keeping alive. Hence the attributes of ingenuity and persistent effort never become strongly developed. In the arctic regions, at the other extreme, life is so rigorous that every bit of vitality is used up in the struggle for survival.

In the tropics there is plenty of time which might be devoted to the so-called higher things of life, but the

traits of character prerequisite to such achievements have not been developed by force of necessity. In the arctic regions, on the contrary, there is ample necessity for developing rugged character, but no time and energy left over after having gained the bare necessities for existence.

In the temperate zones we have the happy medium. The seasonal variations of climate call for ingenuity, skill, planning, and consistent work to maintain the necessities of life on a year-round basis. But with these qualities developed and in operation, there are time and resources to permit continual, constructive accomplishment, first for raising the standards of physical existence, and then for the development of intellectual, cultural, and recreational interests. And thus, so the anthropologists believe, have the seasonal variations and the not too rigorous extremes of climate in the temperate zones induced the development of higher and more progressive types of civilization.

I suggest that we can advance an analogous argument regarding the effect of the economic and political climate. If we had what some would call an economic and political Utopia, with no problems and difficulties, with complete social security, no labor disputes, no political disagreements, no international rivalries, with everything running smoothly and under perfect control, then I wonder if we would not be living in the political tropics. We would lack the stimulus from difficulty, the hardening from struggle, and the occasional wholesome chastening from failure. We might well degenerate, and we might at least miss the satisfaction and even exaltation which come with successful struggle to achieve a desirable objective. I certainly would not say that we should not strive with all our power to achieve an economic and political life

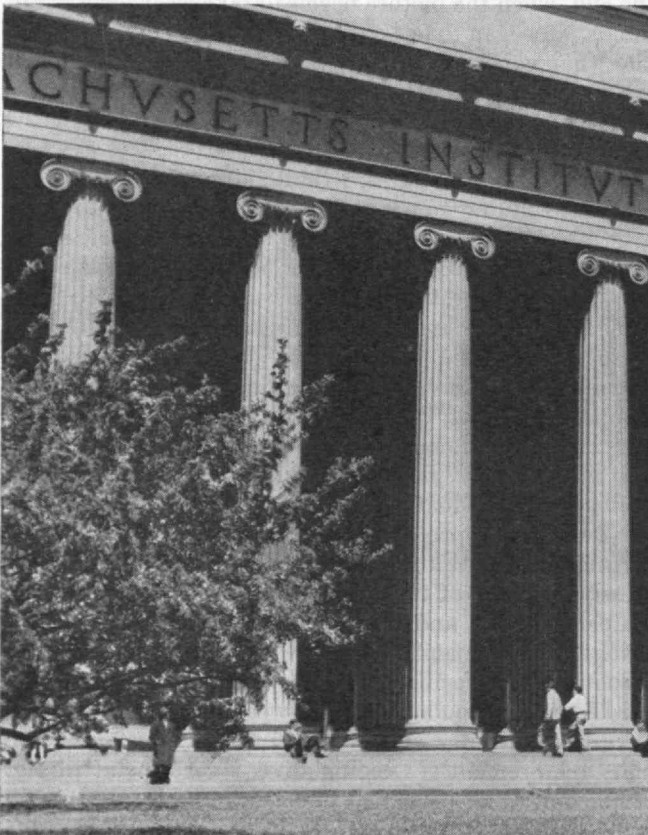
on this planet which is the most perfect which we can devise, but I do suspect that it is a good thing that we will never arrive at a situation in which difficult problems and opportunities for further improvement will not exist.

In similar vein we can see a social analogue to the arctic climate. This would be an environment in which the rigors of economic distress and the buffeting by political forces are so severe that the average man has little hope or energy left after his exhausting struggle for bare survival. Such, unhappily, is the condition of many parts of the world today — those parts ravaged by war and helpless in the face of aggressive political minorities backed by force.

I believe that true democracy is the political analogue of the temperate zone. In democracy exist the differences of opinion and the continual play of economic and political problems which develop social conscience and encourage initiative for progress. A democracy will never be a static Utopia, nor will it be deadened by the rigors of dictatorship. It will have its cycles, like the seasons — business, in boom or recession; employment, up or down; inaugurating or discarding or patching up many a noble social experiment; Republicans or Democrats, Conservatives or Liberals in or out — and all the time people will be arguing about, and working for, improvements. Such is the invigorating climate of democracy, in which liberty and progress thrive. Just as we sometimes wish the winter were not so cold or the summer so hot, so do we often complain and even worry about the inconsistencies and apparent inefficiencies of democracy. Yet out of it all come power, achievement, and real satisfaction in living.

So, again for this reason, I congratulate you on going out to encounter serious problems on every hand.

In this connection I might remark that you have already lived through quite a variety of social climates, so you should be naturally adapted to these stimulating changes. I think you were all born during a Republican administration in our country, at a time when people wondered whether there could ever again be a political majority from any other party. But ever since you could read and write, our Chief Executive has been a Democrat. You were born in the prohibition era, but you have not seen much of it in practice. During your infancy our nation was drunk with illusions of permanent prosperity and universal wealth, and paper fortunes grew by the week. Then came the long period of world-wide depression, from which we in the United States were about the slowest to recover. Then, when prosperity seemed to be with us again at last, came World War II — and now the problems of reconversion to peace. Ten years ago our country was strongly isolationist, and every year college students staged peace strikes and many solemnly pledged themselves never, under any circumstances, to bear arms. Today our people are strongly convinced that we must never again stick our head, ostrichlike, into the international sand; and for the last six years every general public opinion poll has shown a sentiment, among those who express an opinion, of approximately three to one majority in favor of universal military training. In your childhood big business was the whipping boy blamed for our industrial ills. The Wagner Act and other acts were passed to curb big business and to build up a strongly competing labor union movement. (Continued on page 552)



The major purpose of our education is to create the habits, implant the knowledge, and develop the skills which will insure objective and constructive performance.

Commencement of the United Nations

The Great Strides toward Peace, Made in Two Short Years by the United Nations, Require that the United States Be Prepared to Back Up Its Commitments

BY WARREN R. AUSTIN

COMMENCEMENT ADDRESS

THE power and the glory of M.I.T. are in the service it renders to mankind through its graduates. Therefore, I congratulate you upon the remarkable opportunity you have had to receive your education under the direction of a great leader in the promotion of human welfare and in the effort to reach the goal of freedom from war, coercion, and tyranny — Dr. Karl T. Compton.

Your distinguished president has rendered high service to this cause not only as president of this Institute, but as a citizen in the service of his Government. His leading part in the development of atomic energy and the organization of American science in support of the United Nations during World War II will long be remembered by his grateful fellow countrymen. He is continuing his service as consultant to the United States Mission to the United Nations in the negotiations we are pursuing toward the establishment of international control of atomic energy. I wish particularly to pay tribute to the work of the President's Advisory Commission on Universal Training, of which Dr. Compton is chairman. The report of that Commission will, I earnestly hope, help the Congress and the people to an understanding of the vital importance to the establishment of collective security, under the United Nations, of the maintenance by the United States of a strong military establishment founded on universal military training.

We must maintain our military establishment, not for purposes of domination, but in order to be able to back up our commitments in support of collective security under the United Nations. I know that every one of you realize that, if we were ever called upon to join in collective action against a major aggressor, we would not have the two years of grace we were given in the last war. We should have to act with decisive force at once and with men already trained.

Lasting peace is the earnest desire of all mankind. But lasting peace can be secured only as the end product of collective endeavors of many kinds, all directed toward building up a system of collective security. The building of such a system, in turn, depends upon the will and capacity of the member nations to support it with all their strength. There are no short cuts to peace. There is, above all, no way in which great nations like the United States and its individual citizens can evade the responsibilities, the sacrifices, and the burdens that must be carried if we are to establish and maintain a peaceful world order from which war is outlawed. The sacrifice of time during their education that would be required of the younger generation under peacetime universal military training would advance the cause of collective security and strengthen the chances of preventing

another war which might easily be world-wide in scope.

Let us never forget that the United Nations is a means to an end. It is not the end. The mere existence of the United Nations and our participation in it does not establish collective security. The United Nations is a means by which collective security can be achieved.

Also, we must understand that every provision of the charter and every organ of the United Nations has a necessary place in the building of collective security. The work of the General Assembly and the Economic and Social Council, for example, are just as necessary to collective security as the work of the Security Council.

Reduction and removal of the basic causes of war by using the institutions of the United Nations to relieve political, economic, and social tensions and to raise standards of living is a most important element of collective security. Nor should we overlook the importance of such regional security arrangements as the Act of Chapultepec and the Inter-American system, for which the United Nations charter also makes provision.

The United Nations is at the very beginning of its work. It was only two years ago, on June 26, 1945, that the United Nations charter was signed at San Francisco.

During the brief time of your junior and senior years — only two out of the 16 years of your preparation for your careers — the United Nations has been in its preparatory period. Looking back we can see in true perspective the great progress we have been able to make in so short a time toward laying the foundations for building a system of collective security.

During this period the vast organizational structure of the United Nations has been largely completed. The General Assembly, the Security Council, the International Court of Justice, the Trusteeship Council, and the Economic and Social Council with its network of specialized agencies and commissions, are at work. Every day at Lake Success or at Geneva, or at some other regional center of United Nations activities, representatives of the member nations are meeting together to thrash out their differences and to seek and reach agreements for common action.

Political disputes, that might otherwise lead to war, are being debated and investigated instead by the Security Council. Dozens of projects, each of which is aimed at removing some of the basic causes of war, are under way. Let me mention only a few examples.

Secretary Marshall, in his commencement address last week at your great neighbor institution, Harvard University, spoke of the necessity of unified action for the restoration and reconstruction of the economy of Europe.

Only recently the United Nations established an Economic Commission for Europe which will help to make this possible. Every nation in Europe, including Soviet Russia, is a member of this Commission. So is the United States. This Commission is now organized and will meet again next month.

This week, at Lake Success, Mrs. Franklin Delano Roosevelt, chairman of the United Nations Commission on Human Rights, is meeting with fellow members to prepare a first draft of an international bill of human rights that can be submitted to the General Assembly and later to member governments for adoption.

At the same time progress is being made toward establishing a world law that can be enforced on both states and individuals. This week a General Assembly committee completed proposals for the codification of international law and for writing into that code individual liability to punishment for those who break the law against war or who attempt, as the Nazis did, to annihilate any racial or other group of human beings.

Another General Assembly committee left this week for Palestine to seek a United Nations answer for a problem that has defied solution for the past 25 years.

The Trusteeship Council and the trusteeship system and other provisions of the charter relating to dependent peoples are beginning to be used to advance non-self-governing peoples peacefully toward political freedom and higher standards of living.

All of these and many related developments are part of the process of building collective security. They are, in most cases, first steps on a long road. But they are, all of them, directed toward replacing economic conflict by economic co-operation, toward relieving social tensions by justice, toward substituting pacific means of settlement and judicial processes for anarchy and naked force in the relations between nations.

Atomic Energy for Peaceful Uses

Two of the most difficult as well as supremely important tasks in the establishment of collective security are the creation of an international system for the control of atomic energy that will assure its use for peaceful purposes only, and the elimination of weapons of major destruction including the regulation and reduction of all arms. Closely related with these is the conclusion of special agreements under which the Security Council will have at its call peace forces made available by member nations on a basis that will enable the Council to enforce the law against aggression in all parts of the world.

The present period of tension between the East and the West, and particularly between the United States and the Soviet Union, is delaying accomplishment of these tasks. Nevertheless, some progress has been made.

The Military Staff Committee has not secured unanimous agreement on some very important basic principles. But it is too often forgotten that we have in the Military Staff Committee something that the Great Powers did not have confidence enough in each other to establish even in the midst of a desperate war—that is, a permanent Combined Chiefs of Staff of all five of the Great Powers. They meet regularly together and they have succeeded in resolving many of the differences concerning the establishment of the peace forces required by the charter.

The process of learning to understand each other and to achieve confidence in each other is a slow process, particularly in vital military matters, but it is working like a slow leaven here as elsewhere in the United Nations.

In the field of atomic energy, in which you, as future scientists and engineers, have a special interest, the Soviet Union continues to hold out against some of the essential principles for an international control plan originally proposed by the United States and accepted by all the members of the Atomic Energy Commission except the Soviet Union and Poland. Even so, the General Assembly resolution on disarmament of last December 14 marked progress. Unanimous agreement was secured for the first time on the general principle of a system of strict international control both of atomic energy and of other arms which would be established by separate treaties and would, in effect, become as integral a part of the constitutional structure of the United Nations as the charter itself.

Since then there has been little further progress toward agreement with the Soviet Union. Deputy Foreign Minister Gromyko's proposals this week will, I hope, prove to be a further step. The basic disagreements, however, remain. The Soviet Union continues opposed to the majority view on such essentials as the developmental and management functions of the proposed international atomic control agency, as well as on methods of enforcement. The Soviet Union rejects these functions apparently out of fear of capitalist "infiltration" inside Russia. Besides the other disagreements, the Soviet Union continues to call for separate and immediate outlawing of the bomb, instead of making prohibition of the bomb an integral part of the control system. This Soviet proposal, which has been repeatedly rejected by the other nations, would be unilateral disarmament of the United States and would provide no security either to ourselves or to the rest of the world.

Nevertheless, the Atomic Energy Commission is going ahead with the study of the specific proposals that will be necessary to implement the general principles upon which the majority are agreed. When these proposals have been worked out—with their explicit safeguards to each nation, explicit recommendations on the rights of the control agency, explicit opportunities for application to the International Court, to the Security Council or to other agencies of the United Nations for redress of inequities in the operation of the system—it is our hope that the Soviet Union will come to realize that there is no secret or hidden danger to the Soviet state in the proposed system of control. We hope she will also see that the limitations on the sovereignty of each member nation, that the majority believe are essential, can be so applied that they will not operate to the disadvantage of any one system of government or way of life, but on the contrary, will make it possible for each nation to join in the peaceful development of atomic energy without fear of violation of its independence or of destruction by some future atomic aggressor.

The United States, after all, asks nothing of the Soviet Union that we, ourselves, are not prepared to grant. We ask for strict international inspection and control; yet for a long time to come the United States would be the most inspected and the most controlled of all nations. We ask for a small surrender (*Continued on page 566*)

ALUMNI DAY—JUNE, 1947

Aviation—Today and Tomorrow

Anxiety for the Betterment of World Conditions Marks Alumni Day When 1,100 Return to Tech for Reunions

DETERMINATION to face international issues and to build up the nation's security through science and engineering became the theme of activities on Alumni Day, June 14, 1947. More than 1,000 attended the open-air luncheon, sheltered from the rain by tents erected in Du Pont Court; 500 were present at the symposium entitled "Aviation—Today and Tomorrow"; and 1,100 attended the banquet in the largest "pure alumni" gathering of its kind. In contrast with former years, an entire week, from June 7 to June 14, was devoted to activities of graduates and Alumni. These are treated in chronological order in the following columns.

Class Day exercises were held at Walker Memorial under the direction of Class and Senior Week officers: Norman N. Holland, Jr., President; Claude W. Brenner, Secretary-Treasurer; Kenneth A. Marshall, Donald M. Van Greenby, and Arthur Schwartz, Marshals; and Walter Kisluk, Beaver Orator.

As chairman of Senior Week, Kenneth A. Marshall welcomed the Alumni and guests; Walter Humphreys, '97, Secretary of the Corporation, gave the 50-year address; and, in a not-too-serious vein, Earl H. Eacker, '22, gave the graduates good advice from the 25-year Tech Alumni. Norman N. Holland, Jr., presented the gift of the Class of 1947 to Dr. Edward L. Moreland, '07, who accepted it gratefully on behalf of the Institute; and G. Kendall Parmalee, President of the Class of 1948, received the class ring from Mr. Holland. Walter Kisluk delivered the Beaver Oration.

In speaking for the 50-year Class, Walter Humphreys emphasized the rigor of mental discipline, which M.I.T. developed, with the words: "We are grateful for the emphasis put upon increasing our power through the rigid

discipline of the Institute in our school days. Such a training as you have had should give you courage to undertake whatever vocation you are led to assume whether or not it is in the field of your recent professional career."

Having been admonished by Alumni Secretary, Charles E. Locke, '96, not to give advice, Earl H. Eacker spoke generally in a light vein, although some of his remarks bore a serious aspect. Said Mr. Eacker: "I literally boil when I hear people say that government should do this or that for them. The citizens of this country, you and I, are the government. Let us fight to keep it so. There are many so-called political servants who would make us . . . believe we . . . want and are demanding that, through government, something special be done for us."

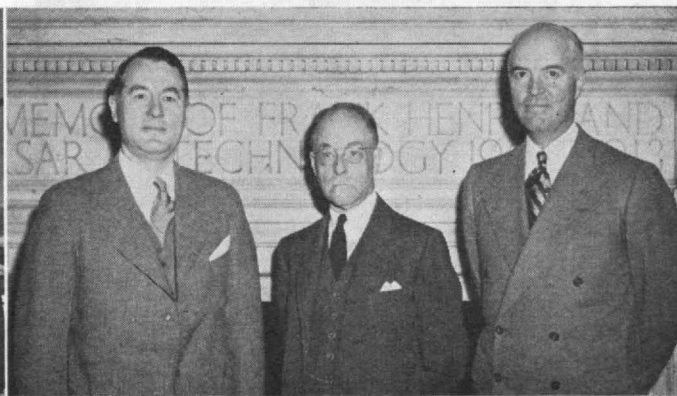
Application Approved

Following tradition in applying for admission to the Alumni Association, the Class of 1947 presented a skit portraying the difficulties which members of the Class had in obtaining positions in industry. During the discussion of their misfortunes at lunch in Walker Memorial, the students watch one of the Institute's janitors obviously displaying signs of affluence. Aroused to curiosity, the students learn that betting on horse races pays big dividends to the janitor who determines the names of the horses in each race which will win, place, and show, by the simple expedient of inserting the racing form in the differential analyzer. Pooling their meager resources, the boys urge the janitor to bet their money on a horse, and the janitor walks off with the comment that some people will believe anything provided it is wrapped up in an atmosphere of alleged science.

As a symbol of acceptance of the Class of 1947 into the M.I.T. Alumni Association, Harold Bugbee, '20, President of the Alumni Association, presented to Norman N. Holland, Jr., the '47 banner of the graduating class.



At the commencement exercises at Boston's Symphony Hall, Warren R. Austin (left), Chief of United States Mission to the United Nations, gave the commencement address, President Karl T. Compton addressed the graduates, and Dr. Sidney Lovett (right), Yale University Chaplain, delivered the invocation.



Taking part in Class Day activities at Walker Memorial on June 7 were (in usual order), Earl H. Eacker, '22, who delivered the address for the 25-year Class, Walter Humphreys, '97, Secretary of the Corporation, who represented the 50-year Class, and Harold Bugbee, '20, President of the M.I.T. Alumni Association.



The events of Class Day, during which the Class of 1947 was admitted into the Alumni Association, please officers of the Class about to be graduated. From left to right are: Claude W. Brenner, Secretary-Treasurer; Norman N. Holland, Jr., President; Walter Kisluk, Beaver Orator; and Kenneth A. Marshall, Chairman of Senior Week — all of the Class of 1947.

Commencement

For the Class of 1947 the week's highlight occurred at Symphony Hall on June 13 when 763 students received a total of 765 degrees from the Institute. Conferred were 53 doctor's, 225 master's, and 487 bachelor's degrees. Among those who received diplomas were 10 young women.

Dr. Sidney Lovett, Chaplain of Yale University, made the invocation, Warren R. Austin, Chief of the United States Mission to the United Nations, delivered the commencement address, and in bidding farewell to the Class of 1947 as students, President Compton welcomed them as Alumni. The Review is pleased to be able to publish the addresses of Mr. Austin and Dr. Compton on pages 533 and 531, respectively, in this issue.

In the evening of June 13, the Myles Standish Hotel was the scene of the President's Dinner for the Honorary Secretaries of the Alumni Association.

Alumni Registration

During the morning and early afternoon of June 14, rain injected a disconcerting element but it did not



Educational exhibits in the lobby of Building 7 greeted Alumni on their return to the Institute and portrayed in pictorial and interesting manner the growth, present activities, and anticipated expansion of the Institute. Shown here is the section illustrating proposed new buildings for which funds are now being raised.

dampen the spirits of more than 1,000 who returned to the Institute to meet old friends and Faculty, to inspect the laboratories and educational exhibits on display in the lobby of Building Seven, and to enjoy themselves as "old grads."

To Admiral Luis de Florez, '11, and his son, Peter, of the Class of 1938, goes the credit of making the most spectacular return to Technology when the Admiral's Navy plane, painted in cardinal and gray with the '11 numerals on it, landed in the Charles River Basin to be met by motor patrol. To Keith W. Robbins, '22, of Korea, goes the credit of having traveled the longest distance to attend Alumni Day. To C. Frank Allen, '72, was given a rousing cheer at the banquet in honor of his 75th year as an M.I.T. alumnus. Finally, but in no sense least, to Charles E. Locke, '96, goes the credit for addressing the banquet by telephone from the cool, comfortable Homberg Infirmary where the Alumni Secretary is rapidly recuperating from a recent operation.

Du Pont Memorial

At noon, the Du Pont Memorial Room was dedicated in the Guggenheim Aeronautical Laboratory. In appropriate words, Professor Jerome C. Hunsaker, '12, recalled the active work of Richard Chichester du Pont as the country's leading expert in gliders and the meteorological problems associated with motorless flight, and stated that the room being dedicated would be used for the recreation of students and guests in aeronautical engineering, as well as for symposia in aeronautical science and related subjects.

The memorial gift was formalized with a few brief remarks by Mr. A. Felix du Pont, Jr., for whose brother the room has been named. Mrs. M. Chichester du Pont, mother of the late airman, was also present. We recall here merely the formal ceremonies which took place on Alumni Day. A more detailed account of the Du Pont Room, and the postdoctorate fellowships established by gift of the Du Pont family, will be found in the Institute Gazette, page 543.

Open-air Luncheon

Whereas the majority of more than 1,000 persons balanced plates in the buffet-style luncheon under the protection of two large circus tents in Du Pont Court, rooms in Building One were reserved for the 25- and 50-year Classes. In traditional manner, President Compton attended luncheon with the Class of 1897, but also took opportunity to speak with members of the luncheon gathering of the 25-year Class, who greeted him enthusiastically, as well as with representatives of many other classes.

Aviation — Today and Tomorrow

By 2.30 P.M. the weather had cleared, and more than 500 persons attended the symposium on "Aviation — Today and Tomorrow" held at Morss Hall of Walker Memorial. As symposium chairman, Professor Jerome C. Hunsaker introduced the speakers: General George C. Kenney, '11, Commander, Strategic Air Forces; Arthur E. Raymond, '21, Vice-president, Douglas Aircraft Corporation; and John C. Leslie, '28, Vice-president, Pan American World Airways. The Review is pleased to publish the symposium addresses in full elsewhere in this issue.

Wind Tunnel

Following the symposium, "open house" was held in the President's Garden and, simultaneously, ground was broken for a supersonic wind tunnel of advanced design, on ground west of Massachusetts Avenue. The new tunnel, financed by the Bureau of Ordnance of the Navy Department for use in a research and development program sponsored by the Bureau of Ordnance, will be used to test aircraft and missile models at speeds ranging from 1,000 to 3,000 miles per hour.

Representatives of the United States Navy, members of the Institute's Administration, and guests attending the ground-breaking ceremonies included: Vice-Admiral George F. Hussey, Jr., Chief of the Bureau of Ordnance; Rear Admiral Daniel V. Gallery, Assistant Chief of Naval Operations for Guided Missiles; Rear Admiral A. M. Pride, Chief, Bureau of Aeronautics; General George C. Kenney, '11, Commander, Strategic Air Forces; President Karl T. Compton; Vice-president James R. Killian, Jr., '26; Dr. Carroll L. Wilson, '32, General Manager of the Atomic Energy Commission; Arthur E. Raymond, '21, Vice-president of the Douglas Aircraft Corporation; John C. Leslie, '28, Vice-president of Pan American World Airways; Dr. Jerome C. Hunsaker, '12, Head of the Departments of Mechanical and Aeronautical Engineering, and Professor John R. Markham, '18, Department of Aeronautical Engineering, who now directs research at the Wright Brothers Wind Tunnel.

Stein-on-the-Table Banquet

As has been the custom for many years, the Statler Hotel was the scene of the Alumni Day Banquet, for which more than 1,000 Alumni gathered in the Imperial Ballroom at 7:00 P.M.

After the banquet courses were finished and the Alumni were well into the process of initiating the new 1947 steins, Harold Bugbee introduced the honored guests at the head table. Missing from the rostrum for the first time in many years was Professor Charles E. Locke, but telephone connections and a public address system enabled the Alumni Secretary to address the group in a 15-minute speech.

Following these introductions, Carroll L. Wilson spoke on "Problems of Management in the Atomic Energy Commission," which is presented in full, beginning on page 529 of this issue.

Following this formal address, Albert J. Browning, '22, presented a gift of \$27,000 to the Institute from his Class, and John P. Ilsley, '97, transferred a check for \$34,000 as a gift of the 50-year Class.

Francis J. Chesterman, '05, chairman of the Alumni Fund Board, announced that the Board had recently voted to make available to the Corporation, as a gift from the Alumni, \$500,000 to be used in the construction of a new Senior House to be erected on land now owned by the Institute west of Massachusetts Avenue.

In his reponse of acceptance, Dr. Compton stated that the Senior House was urgently needed and that it was anticipated that construction on the new housing unit will be well under way in another year. Following acceptance of this gift from the Alumni, President Compton presented his annual report to the Alumni, entitled "Retooling for Peace" and reproduced herewith.



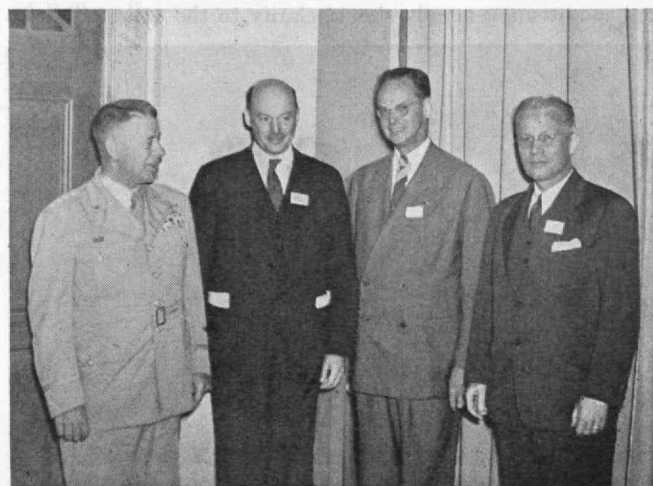
In memory of Richard Chichester du Pont, postdoctoral scholarships in meteorology were established and a recreational room for students in aeronautical engineering was dedicated on Alumni Day. Present at the dedication were Mrs. M. Chichester du Pont, A. Felix du Pont, Jr., who made the presentation on behalf of his brother for whom the room is named, and Dr. Compton.

Retooling for Peace

Retooling for peace at the Institute has not been without its headaches. At the same time, the transition has offered opportunities and challenges which have been met with enthusiasm and vigor by our entire Administration and Faculty, and by you Alumni.

I want to report briefly tonight on some of the highlights of the last year and to give you some of the underlying reasons for the changes that have been made and are contemplated. Let me say at the outset, however, that the basic objectives of M.I.T. are the same today as they were in your student days and as they were when William Barton Rogers brought this institution into being.

Technology has grown not only in size, but in general stature and reputation. The factor of size alone has brought us to a critical analysis of some of our problems. As a result we have taken a careful long-term view of such things as the allocation of space, the proper relationship between sponsored research and the rest of the educational program, our nonacademic relations with students, and our whole financial structure, among others. I have reported to you in some detail on some of these studies, and now I want to mention those which have received closest attention in the year just ending.



Principals in the Symposium were: General George C. Kenney, '11, Commander, Strategic Air Forces; Professor Jerome C. Hunsaker, '12, Symposium Chairman; Arthur E. Raymond, '21, Vice-president, Douglas Aircraft Corporation; and John C. Leslie, '28, Vice-president, Pan American World Airways.



Ready to partake of another Stein-on-the-Table Banquet were honored guests from many classes. In reading order may be seen Earl H. Eacker, '22, 25-year speaker at Class Day exercises; John J. Rowlands (in process of arranging for photographs for newspapermen); Raymond H. Blanchard, '17, President-elect of the Alumni Association; William W. Garth, '36, Chairman of Banquet Committee; Albert J. Browning, '22, who presented the gift from the 25-year Class; Rear Admiral Daniel V. Gallery, who took part in wind tunnel ceremonies; Francis J. Chesterman, '05, who announced \$500,000 alumni gift to complete construction of Senior House; and Arthur E. Raymond, '21, symposium speaker.

The student enrollment has reached an all-time high of 5,250. We had expected that it would rise to 4,500; the assimilation of the additional 750 was not easy but it has been done most effectively through the tireless efforts of the entire staff. The present figure of 5,250 represents an increase of more than 70 per cent above the prewar stabilized enrollment. To give you a measure of the growth of the Institute during the last 50 years, I will recall for you that the total registration was approximately 1,200 in 1897; 3,500 in 1922; and 3,000 in 1942.

Student Body

But what of the student body of 1947? Academically they are significantly better than the prewar group despite the fact that the majority of them have been absent for periods ranging from two to four years. The ill effects of this interruption in their schooling have been more than offset by the added maturity and the determination to get through and get started on their professional careers. About 25 per cent of our students are married; many have children.

Despite the financial help many of these men are getting from the government, the fact that so many of our students are good students, good husbands, and good parents is indeed a remarkable display of ability, planning, and courage.

The reasons for the current bulge in enrollment are well known. The long-term future enrollment is still under consideration. It is clear, however, that the demand on the part of secondary school students and the demands for professional scientists, architects, and engineers will continue indefinitely at a much higher level than before World War II. The tidal wave of returning veterans should begin to subside next year and conditions generally should clarify to the extent that we

can estimate more realistically for the future. Of considerable significance, however, is the fact that applications for admission from secondary schools are now more than double the number we received in 1941.

Where, and under what conditions, are all of our students living? The housing situation in the Boston area is no better than in any other large metropolitan center, yet we can say with some pride that no student has as yet had to sleep on a park bench. Through the ingenuity of Professor Leicester F. Hamilton, '14, Mr. Wallace M. Ross, General Secretary of the Technology Christian Association, the Housing Bureau, the fraternities, and the generosity of many of our staff in making rooms available, the housing problem has been kept under reasonable control. The quarters of some students, both single and married, are still far from satisfactory, however, and the problem remains one to which we shall have to give our continued efforts. The construction of the new Senior Dormitory will greatly alleviate the situation, but under the best of conditions we cannot hope to have it ready for occupancy before the fall of 1948.

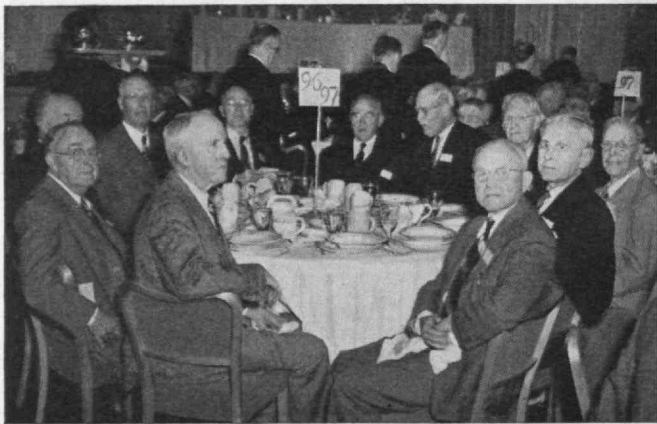
In addition to our regular dormitories and Graduate House, we have provided this year for 500 single students in a converted wartime temporary research building. One hundred married students are living in Westgate, which was built entirely by the Institute at an expense of \$500,000 (which should be recoverable), and 170 married veterans in Westgate West. Despite the fact that the buildings and the erection of Westgate West were at government expense, the Institute had to spend more than \$150,000 (which cannot be recovered) for site work and services.

The Faculty Today

In speaking before The Technology Club of New York, two years ago, Horace S. Ford, Treasurer, very forcefully demonstrated that it is personalities that make a truly great institution. What of our Faculty today? In professional competence, enthusiasm, and morale, the staff of your school is second to none in the world. Considering the fact that many of the staff had scarcely time to catch their second breath between the end of a hectic and heavy war research assignment and the beginning of an excessively heavy teaching and research load last fall, I consider their accomplishments remarkable.

From time to time I have called attention to the fact that the salary level at the Institute needed prompt attention. The adoption of the annual salary plan two years ago helped to increase the guaranteed take-home pay of the staff, particularly the younger staff. As a further step, we increased all staff salaries last fall, retroactive to July 1, by 10 per cent with a ceiling of \$600. In comparison with salary averages in other educational institutions, we are holding our own but are not yet in the position of leadership that we should be, considering the fine quality of our staff.

For many years Technology has taken pride in co-operating with the United States armed services in educating officer



Enjoying more than half a century of life as Technology graduates are (clockwise, from center opening): Henry G. Grush, '96; Robert A. Davis, '96; Perry B. Howard, '96; Francis C. Hersey, '96; James M. Driscoll, '96; Frederick W. Damon, '96; John A. Rockwell, '96; Samuel P. Hunt, '95; Conrad H. Young, '96; Luther K. Yoder, '95; and Edwin C. Alden, '95.



The right-hand half of the speakers' table included (in usual order): Harold Bugbee, '20, President of the Alumni Association; Carroll L. Wilson, '32, banquet speaker; General George C. Kenney, '11, symposium speaker; H. E. Lobdell, '17, Executive Vice-president of the Alumni Association; Vice-Admiral George F. Hussey, Jr., who broke ground for the wind tunnel; Jerome C. Hunsaker, '12, Chairman of the Symposium; John P. Ilsley, '97, who presented the gift from the 50-year Class; Walter Humphreys, '97, 50-year speaker at Class Day; John C. Leslie, '28, symposium speaker; Norman N. Holland, Jr., President of the Class of 1947; and Parke D. Appel, '22, General Chairman of Alumni Day.

personnel in specialized fields of engineering and science. This is particularly true in fields in which our staff and facilities are unique, such as Naval Construction and Instrumentation. As a further step in the co-operation we are accepting a few of the young West Point instructors who come to Cambridge to observe the teaching techniques and to refresh their knowledge of some of the professional courses they will teach at West Point. Yet if we had admitted in the last year all the qualified officers the services wanted to assign here for work in aeronautical engineering, we would not have been able to accept a single civilian student in that course. Appreciating that we have obligations to educate men for industrial posts, we have had to impose limitations on the number of military personnel we can accept in certain of the already overcrowded courses.

The sudden and large increase in student enrollment, as well as the variety of student background, has resulted in a need for closer organized liaison between Faculty and students. Dr. Everett M. Baker, our new Dean of Students, has undertaken to expand our whole system of student counseling. Before World War II, our corps of registration officers, working with the Dean's Office, was reasonably adequate to meet the needs of the students. Dean Thomas P. Pitre, Joseph C. MacKinnon, '13, Registrar, and Dr. Dana L. Farnsworth, the new Director of the Medical Department, and all of the registration officers are co-operating with Dean Baker to bring about a more personal relationship between staff and students.

In my report to the Corporation last fall, I mentioned that suggestions had come from the Faculty and Administration that the time was ripe to stand off and consider our educational objectives. The Committee on Educational Survey, headed by Professor Warren K. Lewis, '05, was appointed by the Faculty last winter and has already made great headway in a re-examination of many of the procedures and practices covering many phases of our activity. Funds have been made available to study and analyze practices in other institutions. The committee has sent memoranda to the Faculty periodically, inviting suggestions and comments. The whole Faculty have thereby become consultants to the committee. The amount of discussion that these memoranda have aroused among the staff is good evidence that the final conclusions of the committee will draw heavily on the wealth of faculty experience, will be representative of faculty thinking, and will have an invigorating effect on our whole program.

Student Activity

The Corporation Committee on Student Activity, under the chairmanship of Donald F. Carpenter, '22, has been very active in promoting the enrichment of student life.* Of the many questions the committee has examined, two stand out as major contributions to the welfare of students. First was recognition for a well co-ordinated living and playing area on the Institute campus. As a result of their recommendations, the area west

of Massachusetts Avenue has been planned to permit the greatest usefulness of our limited space for athletics and future housing. Second, was recognition that student government under present conditions needed guidance. The fact that the student body was bound to be heterogeneous, as a result of so many students leaving and returning at various levels and a lack of continuity in the several class offices, put a severe burden on the top student leaders last fall. All of us have wanted to retain the advantage of student responsibility and leadership in student affairs, for which Technology has long been recognized. The Corporation Committee on Student Activity set up a subcommittee, with Marshall B. Dalton, '15, as chairman, to help the student leaders with their many problems. This committee has worked closely with the Administration and has been so successful in giving a lift to student government without impairing the independence of student management that, on recommendation of Chairman Carpenter, a permanent Advisory Council has now been set up under the Alumni Association.

Athletics is the largest of our extracurricular activities. The Alumni Advisory Council on Athletics, of which Ralph T. Jope, '28, has long been secretary and has served so ably as liaison between the Administration and students, concluded a year ago that a permanently larger student body demanded the full time of a competent director of athletics. As a result, we have just appointed Mr. Ivan J. Geiger to the new post. Mr. Geiger's many years of experience in college athletics provides an ideal background for the type of full-time leadership we need. Again, we shall continue to encourage students to take full responsibility for their extracurricular affairs and we are convinced that this can be done to an even greater extent with a full-time director.



At the banquet, the Faculty was represented (in clockwise order) by: Thomas P. Pitre; Ronald H. Robnett; Delbert L. Rhind; Carl M. F. Peterson, '29; Nicholas A. Milas; James W. F. MacDonald who was honored by the award of honorary membership in the Alumni Association; Frederick G. Hartwell; Walter C. Voss, '32; Antoine M. Gaudin, and Dean Everett M. Baker.

* Report of this Committee will be found on page 544.



Below in clockwise order from left are: R. E. Schmidt, '87; Franklin Brett, '87; N. P. A. Carter, '87; B. C. Batcheller, '86; Mildred Allen, '22; C. F. Allen, '72, celebrating 75 years as Tech alumnus; G. W. Kittredge, '77; S. S. Dearborn, '84; J. A. Cameron, '87; O. E. Nutter, '87; Lonsdale Green, '87; and A. T. Chase, '86, shaking hands with Dr. Compton.

More than 200 members of the Class of 1922 attended the Alumni Banquet. At one of the tables the photographer snapped (in clockwise order from the left): Laurence E. Barstow, '23; Roland L. Smith, '22; W. Raymond Hewes, '22; Lloyd E. Raymond, '22; Clarence W. Perkins, '22; Adolph B. Alland, '22; Theodore T. Miller, '22; Harold C. Wagner, '22; Arthur B. Craig, '22; and Allan H. Kidder, '22.

Research

The volume of our sponsored research has been reduced intentionally to a point where the proportion of time and energy given to such research is consistent with our primary objective, the education of men. We have adhered to the principles that sponsored research should be of a type that advances knowledge, presents a challenge to our staff and will be undertaken enthusiastically, and that the bulk of it be unclassified.

As you well know, we concentrated all of our efforts during the war on research and training with but one objective in mind, to win the war as quickly as possible. As a matter of considered policy, all of the research was carried out on a "no profit-no loss" basis. We have just concluded the final settlement with the Office of Scientific Research and Development, which sponsored 85 per cent of our war research, and I can now report that we received for overhead on our O.S.R.D. contracts a total in the six years of operations of 2.85 per cent of the total dollar volume to cover indirect expenses, such as administration, heat, light, power, and the use of our academic plant and equipment. This amounts in dollars to slightly more than we received in gifts and grants in the one year 1945-46! Any comparison with similar figures for industrial operation adds emphasis to the real meaning of "no profit-no loss" and to the philosophy that M.I.T. is dedicated to the public service. In services freely given the government without compensation, we estimate that the Institute contributed about one million dollars worth of services, without reimbursement.

As a part of our expansion for war research we greatly increased our available academic space. Two facts should be kept well in mind in this connection: first, a great deal of the added space was of temporary construction, expensive to maintain and of no permanent lasting value to our purposes; second, of the cost of the permanent buildings constructed during the war, the government paid only what it would have cost to erect temporary structures. M.I.T. provided the balance.

In mentioning our wartime research policies, I do not want to imply that we are in the least regretful of our decisions. The cause was so important that we would take the same steps today that we have taken in the last seven years. Rather, I want you to understand that M.I.T. did not make money during the war; expansion has added significantly to our maintenance costs.

The added space, however, represents only a part of our fi-

nancial problems. A survey by the American Council on Education shows that since 1940, operating costs in colleges have risen 52 per cent, that half of the increase is due to heavy veteran enrollment, that it costs 10 to 15 per cent more to educate the G.I. than other students because of the red tape involved. These figures are indicative of the situation throughout the country and apply with even greater force to M.I.T., since the expenses of operating a technical institution are always greater than those of the liberal arts type.

Finances

It follows without any demonstration that no nonprofit institution can operate on a \$14,000,000 scale with the help of an endowment geared to a \$3,500,000 level. This is precisely the position we are in today.

Our frank appraisal of our present status leads us to the conclusion that we must seek a total of \$28,000,000 to carry on even frugally the job that must be done. The basic needs include facilities in the war-born fields of science and engineering, such as electronics and nuclear science and engineering, as well as other facilities necessary to the health, welfare, and both the cultural and technical education of our youth. These needs have been set forth in a brochure, a copy of which has just been sent to the Alumni. As a member of the Institute family I know you will be interested in becoming better acquainted with the plans we have made for rendering more effective service in the years ahead.

Of the total needs of \$28,000,000, we have already received or have pledges for \$8,000,000. This is indeed a good start toward our ultimate goal. During the last year, we have received in gifts and grants a total of \$2,234,000, of which \$396,000 came from industrial companies, \$1,262,000 from foundations, and \$576,000 from individuals. In addition, we have received during the year assurances of future gifts totaling \$813,000.

The welfare and security of the United States are closely related to the welfare and security of our educational institutions. A vigorous and flourishing educational system is our best assurance of continued prosperity and intelligent alertness.

In conclusion, I will say that retooling for peace has been as exciting as it has been difficult. We look to the future with enthusiasm, and with the full confidence that we have your hearty support.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Election Returns!

IN concluding an active year of alumni progress, reports of officers, committees, and advisory councils constituted the major portion of the 257th meeting of the Alumni Council which was held in the Campus Room of the Graduate House on May 26.

President Bugbee presided at the meeting attended by 93 members and guests, including Raymond H. Blanchard, '17, and John A. Lunn, '17, recently elected president and vice-president, respectively, of the M.I.T. Alumni Association.

The results of the annual ballot counting showed that the following had been elected: President, for one year, Raymond H. Blanchard, '17; Vice-president, for two years, John A. Lunn, '17; Executive Committee, for two years, Horatio L. Bond, '23, and Dwight C. Arnold, '27; Term Members of the Corporation, for five years, James McGowan, Jr., '08, Harold Bugbee, '20, C. George Dandrow, '22. The following members of the National Nominating Committee were also elected: *District 8*, Jonathan A. Noyes, '12; *District 9*, Stephen L. MacDonald, '39; *District 10*, Dr. Henry C. Gunning, '26.

At the meeting of the Executive Committee earlier in the day, James W. F. MacDonald had been elected a new honorary member and H. E. Lobdell, '17, Charles E. Locke, '96, and Ralph T. Jope, '28, had been re-elected officers of the Alumni Association for the coming year.

Upon conclusion of reports rendered by committee and advisory council chairmen, President Bugbee introduced President Compton who told the Council of the desire, on the part of the Corporation and the Administration, to provide new athletic facilities as soon as funds for this purpose could be obtained.



Breaking ground for the Institute's new wind tunnel is Vice-Admiral George F. Hussey, Jr., while in good-natured repose are standing (left to right): John R. Markham, '18, Professor of Aeronautical Engineering; Jerome C. Hunsaker, '12, Head of the Departments of Aeronautical and Mechanical Engineering; Rear Admiral Daniel V. Gallery, and Rear Admiral A. M. Pride.

President Bugbee then introduced Dr. Everett M. Baker, Dean of Students, whose address was entitled "A Dean's Hopes for the Future." In order to develop a community of interest and thought among the students, Dean Baker hoped that in the future more dormitories would be built and that all freshmen could be imbued with the desirability of developing a greater consciousness for community spirit and co-operation as a training for the student's later life. Dean Baker expressed the hope that it would ultimately be possible for the Institute's students to live together in a Technology community near M.I.T. Since plans for additional housing units are scheduled for construction along Memorial Drive between Massachusetts Avenue and the Cottage Farm Bridge, this area would appear to be most desirable for the development of such a community. With a major portion of the student body living together during their years of study, Dean Baker held forth the hope that a properly stimulated community life would provide for cultural development which cannot be achieved under present conditions. As a means for increasing interest in extracurricular activities, members of the Faculty who were proficient in some hobby or sports, were encouraged to devote time, after class, to directing or stimulating extracurricular student activities.

Clark S. Robinson, 1888-1947

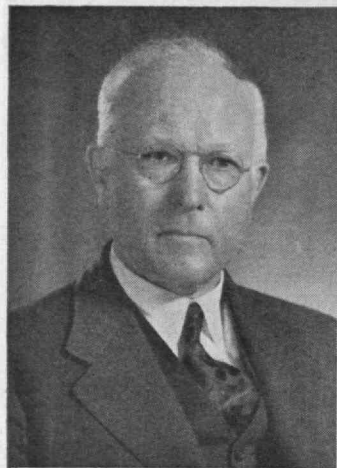
CLARK S. ROBINSON, Associate Professor of Chemical Engineering, who attained eminence for his research and publications in the field of distillation, died on Friday, May 23.

Born on April 8, 1888, in Fall River, Mass., Professor Robinson was graduated from the Institute with the degree of bachelor of science in 1909 and was awarded his master's degree in 1915. He joined the instructing staff in 1916 and was made an assistant professor of industrial chemistry in 1919. He was appointed associate professor of chemical engineering in 1925.

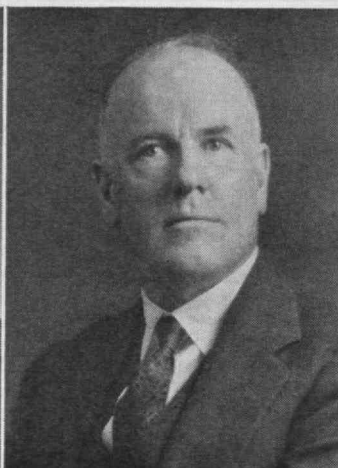
During World War II, Professor Robinson held the rank of colonel in the Ordnance Department and was active in the safety and security division of the Ordnance Department and the Army-Navy Explosives Safety Board. Notable improvements in the manufacturing and handling of explosives in wartime and the great reduction in accidents from explosions and fires associated with high explosives were due in large degree to the effective measures established by these organizations.

Professor Robinson's chief activity in this connection was organization of the work of these agencies on a scientific basis. While World War I was notorious for many accidental and planned fires and explosions, World War II had within the continental United States relatively few disasters of an accidental type and none due to sabotage.

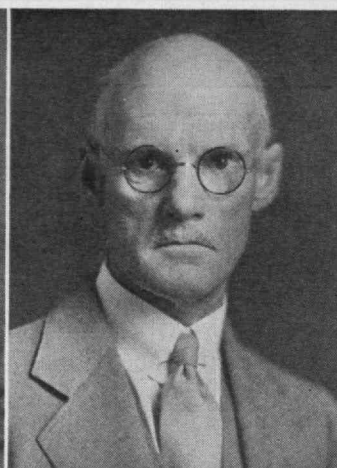
Professor Robinson spent most of his time during the war at the Signal Laboratory at Fort Monmouth, N. J., and in Washington, and for his contributions to safety he was awarded the Legion of Merit.



LYMAN M. DAWES, '23
Assistant Professor of Industrial Applications



ARTHUR B. ENGLISH
Technical Instructor in Mechanical Engineering



ARTHUR L. GOODRICH, '98
Associate Professor of Drawing and Descriptive Geometry



WALDO V. LYON, '05
Professor of Electrical Machinery

Emeriti

THE retirement of eight members of the teaching staff, who have taught at the Institute for many years, has been announced by Dr. Compton. Those members of the staff who will retire on July 1 are: Professor Henry B. Phillips, Head of the Department of Mathematics; William N. Seaver, the Institute's Librarian; Henry L. Seaver, Professor of History in the School of Architecture and Planning; Professors William H. Timbie, Waldo V. Lyon, '05, and Lyman M. Dawes, '23, all of the Department of Electrical Engineering; Associate Professor Arthur L. Goodrich, '98, of the Section of Graphics; and Technical Instructor Arthur B. English of the Department of Mechanical Engineering.

Professor Phillips, who is to be succeeded as head of the Department of Mathematics by Dr. William T. Martin, joined the M.I.T. Faculty as an instructor in 1907. Professor Phillips was graduated from Erskine College in 1900, and then carried on graduate work at Johns Hopkins University, which awarded him the degree of doctor of philosophy in 1905. His teaching career began at the University of Cincinnati, where he was an instructor in mathematics from 1905 until he joined the staff of the Institute. Professor Phillips became a full professor in 1927 and in 1934 he was appointed acting head of his Department and became its head a year later. He has also been a consulting professor of physics at Brown University and a lecturer at the University of California. During World War I Professor Phillips took special training at the Coast Artillery School at Fort Monroe, Va., and later carried on scientific work at the Naval Experimental Station at New London, Conn. He is the author of more than 20 books and scientific papers, chief among which are "Notes on Einstein's Theory of Gravitation," "Faraday's Law as a Basis of Electromagnetic Theory," and a text on *Vector Analysis*.

William N. Seaver joined the library staff of the Institute in 1925 as an assistant to Robert P. Bigelow, then librarian, and in the same year succeeded Professor Bigelow as head of the library. Mr. Seaver was educated at Millbury High School and Worcester Academy and was graduated from Harvard University in 1900. He joined the staff of the New York Public Library in 1910 after several years of experience in the publishing business,

and in 1914 he joined the Municipal Reference Library, a special branch established for the use of New York City employees. In 1919 he was a delegate for the Library War Service of the American Library Association at Edgewood Arsenal, later transferring to Newport News where he had charge of the collection of books and periodicals for servicemen overseas. Before joining the Institute's library, Mr. Seaver had been librarian of the Woburn Public Library from 1920 to 1924.

Professor Henry L. Seaver has been a member of the Institute's teaching staff since 1901 and until 1933 he was on the staff of the Department of English and History. In 1907 he became an assistant professor, and an associate professor in 1916, rising to the rank of full professor in 1929. In recent years he has been a member of the Faculty in the School of Architecture and Planning, specializing in courses in the history of painting and European civilization and art. Professor Seaver was graduated from Harvard University in 1900, and in 1914 he completed graduate work for the degree of master of arts. He has been associated for many years with the Boston Museum of Fine Arts and is widely known as an authority on typography, woodcuts, and photography. He is the author of *The Great Revolt in Castile*, a history of medieval Spain, and has contributed numerous papers to various journals in the fields of his interest.

Professor Timbie joined the Institute's staff in 1919 after several years of experience in electrical engineering instruction at the Pratt Institute in Brooklyn, N. Y., and at Wentworth Institute in Boston where he was head of the department of applied science. He is widely known as an educator in the field of electrical engineering and is the author of several books on electrical subjects which are recognized as standard texts in many schools and colleges. The Electrical Engineering Co-operative Course was established largely through his efforts and he has been in charge of the Co-operative Courses at the Institute for many years. Professor Timbie was graduated from Williams College in 1901.

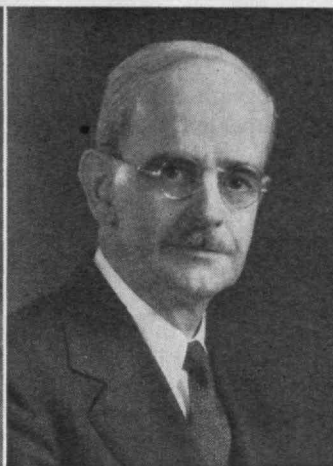
Professor Lyon is widely known for his studies of alternating current machinery, properties of conductors, and other electrical problems involving mathematical analysis. He joined the Institute's staff as an assistant in electrical engineering upon his graduation from M.I.T. in 1905. Two years later he was made an instructor and was



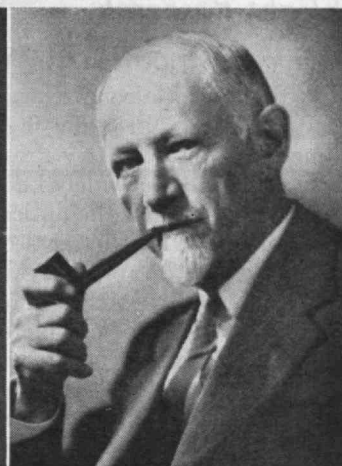
HENRY B. PHILLIPS
*Head of the Department of
Mathematics*



HENRY L. SEAVER
Professor of History



WILLIAM N. SEAVER
Librarian of the Institute



WILLIAM H. TIMBIE
*Professor of Electrical Engi-
neering and Industrial Practice*

advanced to the rank of assistant professor in 1916, and to professor of electrical machinery in 1929. He is a fellow of the American Institute of Electrical Engineers, and has written numerous technical articles on subjects on which he is recognized as an authority. He is the author of *Problems in Electrical Engineering*, *Problems in Alternating Current Machinery*, and *Applications of a Method of Symmetrical Components*.

Professor Goodrich was graduated from M.I.T. in 1898 and has been associated with the Institute staff since 1902 when he was appointed an assistant in mechanical drawing. In 1905 he became an instructor in drawing and descriptive geometry and was an assistant professor from 1917 to 1926, when he was promoted to the rank of associate professor. Since 1939 he has been a member of the staff of the Section of Graphics.

Professor Dawes joined the staff of the Institute as an assistant in 1922 while he was still a student and received his degree from the Institute in 1923. He was a research assistant from 1924 to 1925, when he became an instructor in electrical engineering, serving until 1941 when he was made assistant professor of industrial applications.

Mr. English, technical instructor in mechanical engineering, became an assistant on the Institute's staff in 1907 in the Department of Electrical Engineering. He served as an assistant in machine tool instruction until 1917, and as instructor in the same field until 1920, when he was made an instructor in mechanical engineering with faculty rank. He became a technical instructor in 1941.

Du Pont Fellowship in Meteorology

THE memory of Richard Chichester du Pont, who until his death in 1943 was one of the country's leading experts on gliders and the meteorological problems associated with motorless flight, has been perpetuated in a memorial established at the Institute.

The memorial, made possible by a gift of \$110,000 from members of Mr. Du Pont's immediate family, endows a postdoctorate fellowship in meteorology; it will also provide a memorial room in the Guggenheim Aeronautical Laboratory for the use of students in aeronautical engineering and related fields. By enabling outstanding students to continue advanced study and research after completing their work for the doctor's degree, the fellow-

ship will contribute directly to the advancement of the aeronautical sciences. The Du Pont Memorial Room provides a much needed place for students to come together for social and professional objectives under dignified and attractive conditions.

At the time of his death during a glider test for the Army Air Forces at March Field, Calif., on September 11, 1943, Mr. Du Pont, who was 32 years old, had achieved wide recognition for his contributions to the art of gliding. In the powered-plane field he had pioneered in the pickup air-mail service, which was inaugurated in 1939 by his company, All American Aviation, Inc., for 115 cities and towns in the East where no airport facilities existed.

Members of the family who have established the memorial at M.I.T. include Mr. Du Pont's father, A. Felix du Pont of Wilmington, Del.; his mother, Mrs. Chichester du Pont; his widow, Allaire C. du Pont; his brother, A. Felix du Pont, Jr.; his sisters, Mrs. James P. Mills and Miss Lydia C. du Pont; Irene du Pont, '97; and Henry B. du Pont, '23.

For his notable contributions to the glider program of the Army Air Forces during World War II, both in this country and abroad, Richard Chichester du Pont received many posthumous honors. On December 20, 1943, he was awarded the Distinguished Service Medal by General Henry H. Arnold "for exceptional professional ability and inspiring leadership in planning and supervising the effective utilization of military gliders and related equipment"; on April 19, 1944, the John Price Wetherill Medal of the Franklin Institute; and on November 15, 1944, the Evans Glider Trophy of the Army Air Forces "for the greatest individual contribution to glider development in 1943."

Mr. Du Pont was the holder of numerous American glider records in the middle 1930's and was national soaring champion several times. While competing in the national soaring events at Elmira, N. Y., in 1937, he won the \$1,500 silver Evans Trophy. Convinced that the art of glider flying — soaring through the air without motive power — was the most fascinating of all sports, he was one of the first to foresee commercial and military applications for gliders. He was president of the Soaring Society of America in 1938, was a director of the Institute of Aeronautical Sciences, and president of All American Aviation, Inc. from 1938 until his death.

Flight Research

APPPOINTMENT of Dr. Edwin G. Schneider to be director of a comprehensive program of research on controlled flight, including flight at supersonic speeds, was announced on June 3 by President Compton.

Dr. Schneider is widely known for his research on television tubes, radar, the optical properties of solids in the extreme ultraviolet, and secondary electron emission. He was educated at Wesleyan University from which he was graduated with the degree of bachelor of science in 1929, after which he completed studies for the degree of doctor of philosophy at Harvard University in 1934.

From 1934 to 1936, Dr. Schneider was a research assistant at Harvard, in 1937 he was a research physicist for the Farnsworth Television Company, and during 1937 and 1938 he held a similar post with the Philco Radio and Television Company. He joined the department of physics at Stevens Institute of Technology as an instructor in 1938 and was appointed an assistant professor in 1939, a post which he has held until his appointment to M.I.T. Since 1945 he also served at Stevens Institute of Technology as assistant to the president for research.

During World War II he was granted leave of absence to join the staff of the Radiation Laboratory at M.I.T. where he carried on research from 1941 to 1945. During this period he was leader of a group which directed the development of ground radar for control of aircraft and for early warning. The instruments developed by this group played a vital part in the operations of the Army Air Forces in the war. From March to August, 1944, Dr. Schneider was in charge of ground radar developments at the British branch of the Radiation Laboratory. From 1944 to October, 1945, he was expert consultant to the Office of the Secretary of War and was a member of the Advisory Specialist Group, Far Eastern Air Forces, during the summer of 1945.

In 1946 Dr. Schneider was appointed chairman of the Electron Tube Panel of the Joint Research and Development Board. For his services during the war, Dr. Schneider was awarded the Bronze Star Medal for aid given the Army Air Forces in their use of radar in the Pacific.

Stratton Prizes

DURING the academic year of 1930-1931, President Samuel W. Stratton gave three cash prizes in establishment of a competition, open to all undergraduates of M.I.T., and intended to stimulate student interest in the national professional engineering societies and to encourage young men in the skillful preparation of scientific and engineering papers. Subsequently, friends of Dr. Stratton continued the awards, except for the period during World War II.

Papers presented on the evening of June 12, at Lowell Court, were: "Frequency Modulation" by James G. Ulmer, '47, IX-B, awarded first prize by the judges; "Atomic Radiation" by Joseph M. Rault, Jr., '48, XIII-C, awarded second prize; "Social Responsibilities of Science" by Vincent L. McKusick, '47, VI-A; and "Maintenance of Heavy Equipment Machinery" by Thornton E. Smith, '48, I.

Transcriptions of the M.I.T. Glee Club were played during the intermission, and informal dancing at Walker Memorial followed the conclusion of the contest.

To Broaden the Man

YOUR Committee * has reviewed with the members of the Administration the organization and facilities of M.I.T. which pertain to student living quarters, extra-curricular activities, and athletics. During the war period these matters could be given but little attention. A comprehensive review has, therefore, been undertaken by the Administration, and plans for improvement are being developed.

The primary purpose of M.I.T. is to give young men and women an education specializing in engineering, science, architecture, and management. To do so requires elaborate laboratories, classrooms, and libraries, and the services of an extremely competent faculty. The studies required to qualify a student for a degree are so extensive that practically all of the student's time during nine months of the year for four years must be devoted to mastery of his studies. The educational standards of M.I.T. are the highest, and the Institute stands at the pinnacle of eminence in engineering and scientific teaching. Institute graduates are in the forefront in the various professions throughout the country. Nothing should be done to detract from the excellence of this engineering and scientific education.

It is possible, however, that through improved living conditions and through improved recreational facilities for the development of intramural and intercollegiate competitive athletics and the stimulation of other student activities, our engineering and scientific education can be greatly enriched and the quality of the M.I.T. graduate as a potential factor for good in American engineering and science thereby improved.

The Committee believes that the student should have comfortable and convenient living quarters, where he may associate with his fellow students and make those personal contacts which are so important.

M.I.T. extracurricular activities have in the past provided an excellent outlet for student interest, ingenuity, and enthusiasm. In athletics the Institute has, in some instances, been highly successful. At present more than two out of every three students take no part whatsoever in extracurricular athletics or activities. This is a student problem which should rest largely upon undergraduate ingenuity, but student participation should, in our opinion, be encouraged.

It is the belief of the Committee that athletics are highly beneficial and that they should be actively encouraged.

The Alumni Association has been most helpful in the conduct of activities and athletics. It has furnished advisory committees to assist and guide the students. Recently the Administration has placed greater responsibilities upon the office of the dean of students. This office is now called upon to exercise a degree of guidance over the dormitories, activities, and athletics. To assist the dean, a director of athletics has been appointed. The Committee is favorably impressed with this program and with the appointments which have been made.

An unusual opportunity for M.I.T. progress is at hand in the stimulation and expansion of student life and ac-

(Continued on page 548)

* Members of the Visiting Committee on Student Activity for 1946-1947 are: Donald F. Carpenter, '22, chairman, Horace W. McCurdy, '22, and J. Willard Hayden.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

It is amazing how often trouble turns out to be the best of introductions, resulting in firm friendships and new customers. That has been Revere's experience throughout its long history.

Take the case of an important new invention, originally developed for war purposes but now being increasingly employed in valuable peace-time applications. At first, rejections were impossibly high, over 40%, costs were exorbitant, and production was so low that the great hopes held out for the device seemed almost impossible of realization, due to the limited numbers made.

At this point Revere, though it had not been supplying metal for the product, was asked if it would care to investigate the possibilities of breaking the bottleneck. Meeting with engineers under conditions of complete secrecy (which is not unusual for Revere during development work) the trouble was studied thoroughly. Conferences were long, and many possibilities were cooperatively explored. Eventually it was decided that a change should be made in fabrication methods, and also in the properties of the metal used.

These conclusions seemed so promising that a test run was made. It was completely successful. Subsequent production experience was most gratifying. Rejections were cut to less than 1%, production was stepped up to such a degree that the bottleneck simply ceased to exist, and costs were reduced to commercial levels, where they remain to this day.

This work was a mutual endeavor. No one person or organization can take the credit for it, which is typical of modern industry. A great many of today's products are so complex in conception, design, and manufacture that it is probably safe to say that no man or company can possibly have all the knowledge required to cure the various troubles that so often beset a business. It becomes necessary to call in outsiders having specialized experience, and for a time to make them insiders.

Suppliers to every industry have an enormous fund of information about their materials, whether they be metals or plastics, glass or chemicals. They know how they act under various conditions, which one is preferable under given circumstances and what improvements may be achieved by making changes. They cannot of course reveal confidential data acquired while working with customers, but their general fund of knowledge and experience is invaluable, and usually heightened by a fresh viewpoint.



Revere is not the only one to welcome trouble as an introduction and a challenge, not the only one with an open mind as well as an informed one, not the only one ready to question the customary and find new answers to new problems. So if you are a manufacturer seeking answers to difficult questions, searching for ways to make better products, more quickly and economically, I suggest you introduce your industry's suppliers to your difficulties, and ask their cooperation.

B. Donald Dallas

Chairman of the Board

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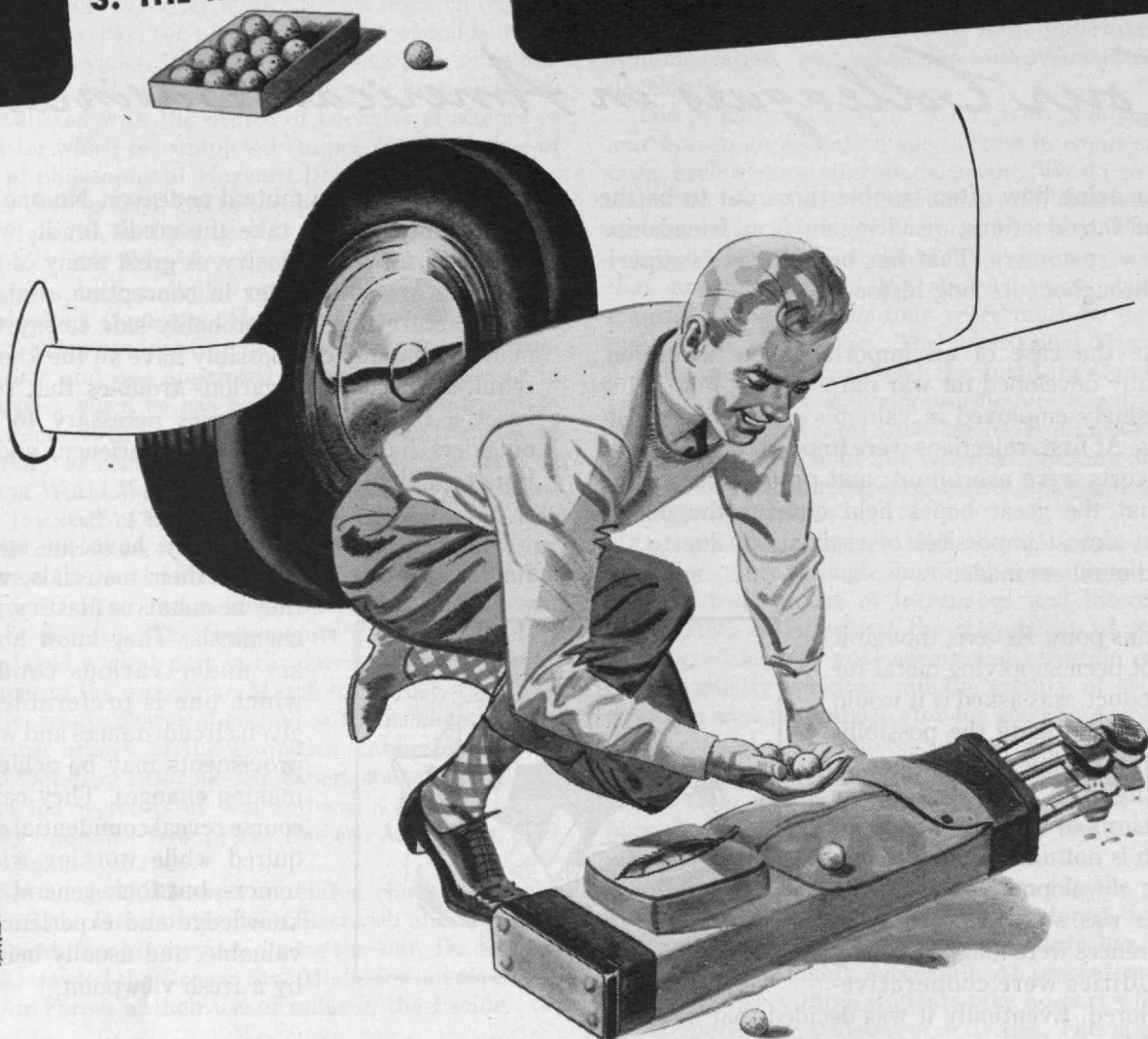
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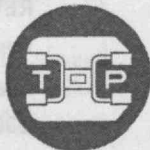
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ber products, lathes for producing rubber rings for food jars, equipment for cutting sheet rubber into threads, and a host of special machinery for this highly complex industry. In fact, Taft-Peirce has an unmatched record in the design, tooling, and manufacture of special machines in every field of industry from Aircraft to Zippers.

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of oil cooler failure. A significant factor in the design of this oil cooler was Clifford's unique wind tunnel laboratory—the largest, most modern in the industry—which supplied the basic data resulting in an oil cooler meeting the 47B's special requirements. Inquiries concerning aluminum oil coolers are invited. Clifford Manufacturing Company,

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All-Aluminum Cylindrical Oil Cooler



All-Aluminum Oval Oil Cooler

THE INSTITUTE GAZETTE

(Continued from page 544)

tivities. Several years before World War II, M.I.T. wisely procured the tract of approximately 50 acres of land west of Massachusetts Avenue. On it an excellent track and field house were constructed. The site now stands ready for further development and it has been reserved for student and faculty living and recreational use; it is ideal for the purpose, and no scholastic expansion is planned in this area. The Administration has prepared preliminary plans for the development of this tract. These plans include a gymnasium, tennis courts, and fields for baseball, soccer, lacrosse, touch football, soft ball, and other games. There is also provision for the presently proposed Senior House and for many additional dormitories, a faculty club, fraternity houses, and so on. The Charles River Basin has provided excellent opportunities for crew and sailing, and use of it can be further expanded. The proper development of the excellent tract of land and the use of the Basin would profoundly change the atmosphere at M.I.T., and students would materially benefit thereby. James R. Killian, Jr., '26, Vice-president of the Institute, ably describes the objective as follows: "Altogether we want to contrive an environment here which performs in the broadest sense an educational function itself, not in a passive way but in a dynamic way. The whole complex of living conditions, activities, and atmosphere must be skillfully arranged to provide the kind of environment that will develop leadership, breadth, and standards of taste and judgment among our students."

In the opinion of the Committee the opportunity is at hand and we wish, therefore, to recommend for most serious consideration and adoption the following statement of policy in order that the importance of this phase of M.I.T. education may be given proper emphasis and that we may clarify our objectives:

Resolved: That it is in the interests of a sound educational program at M.I.T. to provide: (a) Dormitories adequate to accommodate the maximum number of students consistent with the housing needs of the student body and a stabilized enrollment at the Institute. (b) Athletic and recreational facilities adequate to accommodate all reasonable needs of student and faculty members who may wish to use them and to permit intercollegiate competition. (c) Facilities adequate for the conduct of extracurricular activities. (d) Administrative personnel adequate for the guidance and encouragement of a balanced extracurricular program for the student body. (e) Freshman participation in athletics as a part of the educational program.

Resolved Further: That maximum benefit from activities, including athletics, will be attained only when the students assume full responsibility for the operation of these activities, the Administration and the Alumni Association assisting in an advisory capacity only, except in such cases where more direct action may be required to protect the reputation or properties of M.I.T. or to avoid detrimental effect on the educational program.

Resolved Further: That the Administration and Executive Committee of the Corporation give these objectives serious consideration in the allocation of operating and capital funds.

Functionalism in Civil Engineering

WELL-ATTENDED meetings of the Visiting Committee on the Department of Civil and Sanitary Engineering* were held at M.I.T. on December 2 and 3, 1946, and at the Union League Club, New York City, on January 4, 1947. On December 2 the morning was spent in conference with Professor John B. Wilbur, '26, Head of the Department, while the afternoon was devoted to an inspection of Department facilities. The morning of December 3 was spent with staff members of the Department in conferences on the departmental divisions of Structural Engineering and Soil Mechanics, Hydraulic Engineering, Transportation Engineering and Surveying, and Sanitary Engineering.

During the past year, while the enrollment at the Institute as a whole has increased 108 per cent, the enrollment in the Department has increased by 125 per cent. Although perhaps primarily due to the increase in the total Institute enrollment, this increase is nevertheless gratifying and is among the factors that encourage a continuation of the aggressive and comprehensive program for the Department.

The proposed new hydrodynamics laboratory continues as the foremost need of the Department. Although some of the funds that will be needed for construction of it are in hand, an effort to increase this sum should rank high in the Institute's program. The Committee further recommends that funds be allocated now for the immediate preparation of the working drawings and specifications of the proposed laboratory. Only by such a procedure is it possible to insure readiness to begin actual construction without undue delay after sufficient funds have been raised and restrictions against construction have been removed.

Consideration should also be given to the development of a Sanitary Engineering research program, including the construction and operation of a pilot-type experimental station and the accumulation of basic data relating to the economical treatment of industrial wastes, alone and in combination with sewage. The facilities of the William Thompson Sedgwick Laboratories of Sanitary Science and the qualifications of the Sanitary Engineering staff make it possible for M.I.T. to undertake experimental research in co-operation with an industrial association or a government agency, to the benefit of both.

The Committee believes that the requirements for admission to the Graduate School for work in Sanitary Engineering should be modified to be more adaptable to varying and less specific kinds of undergraduate preparation. Such modifications are to be based on proper substitutions of alternate requirements which will lower neither the standards of the entrance requirements nor the ability of the student to pursue graduate work in his chosen sector of Sanitary Engineering.

The Committee urges the early resumption of research in the Cement and Concrete Laboratory of the Department. Steps have already been taken to insure that the renewal of this activity will be conducted in a manner such that it will be co-ordinated with the activities of

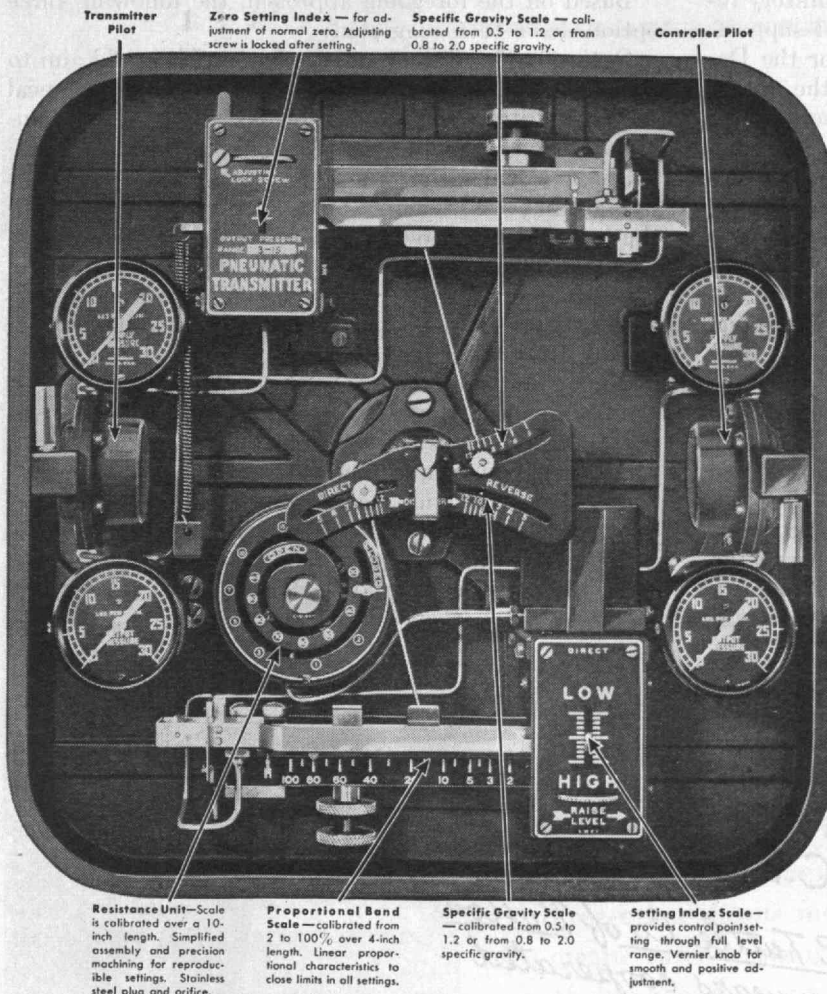
(Continued on page 550)

* Members of this Committee for 1946-1947 are: Thomas C. Desmond, '09, chairman, Allan R. Cullimore, '07, Walter D. Binger, '16, Duncan R. Linsley, '22, Horace W. McCurdy, '22, William H. Mueser, '22, and Beauchamp E. Smith.

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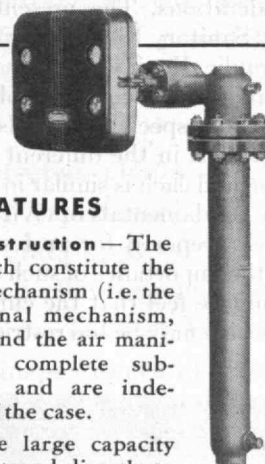
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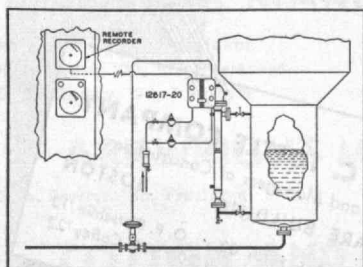
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THE INSTITUTE GAZETTE

(Continued from page 548)

other departments and thus place research in concrete at M.I.T. on the highest possible level. It is hoped that research in cement and concrete may be resumed as soon as the Department is able to add a staff member properly qualified to head this activity.

The establishment of a photogrammetry laboratory remains as an objective that has our continued support. Space for this purpose has been earmarked for the Department, but further development requires the appropriation of \$7,500 for the purchase of equipment which the Committee recommends.

The Committee has studied with much interest Professor Wilbur's proposal that the undergraduate curriculum in Civil Engineering be substantially revised so that options are based on functional, rather than technical, considerations. The present curriculum offers four options: Sanitary Engineering, Transportation Engineering, Hydraulic Engineering, and general Civil Engineering, the latter of which gives abbreviated work in each of the three more specialized fields. Some variation exists as to the content in the different options, but the educational aim behind each is similar in that the effort is to train men in the fundamentals of civil engineering so that they will be well prepared for professional work. Without belittling the importance of such training, some members of the Committee feel that the curriculum as now set up has a goal which may be too restricted; that it fails to recognize

other objectives; and that it is not wholly adaptable to the incorporation of potentially important new trends.

Instead of setting up options on the basis of various technical phases involved in civil engineering, it is felt that it may be desirable to establish options which differentiate between the types of mental effort involved in civil engineering activities. Although representing an oversimplification, it may be said that a civil engineering project involves three phases: (1) conception; (2) design; and (3) construction.

Based on the foregoing approach, the following three options have been suggested:

Option I: The Theory and Design option would aim to serve the needs of students who wish to become technical specialists. Structural theory, fluid mechanics, soil mechanics, and so on, would be emphasized. In general, technical professional subjects would be presented on a broad base so that the principles taught would be applicable to the solution of problems not restricted to the field of civil engineering. The curriculum would be similar to the present undergraduate Course in Civil Engineering.

Option II: An option in Planning and Administration, intended for those who are primarily interested in the planning and administration of construction projects, would provide a civil engineering background with emphasis on the social aspects of civil engineering projects. Methods of conservation, highway and airport engineering, flood control, and similar topics would be included in this option. Undergraduate Sanitary Engineering could be incorporated into this option by means of special electives in Sanitary Chemistry and Bacteriology.

(Concluded on page 552)

MEMO TO: M.I.T. alumni
FROM: M.C.T.

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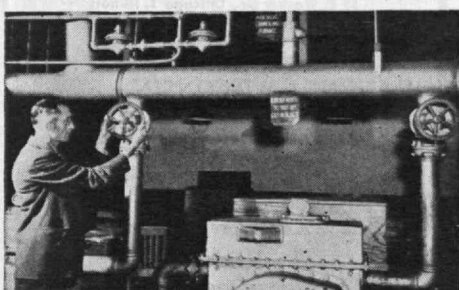
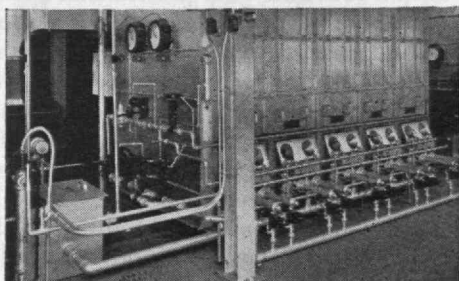
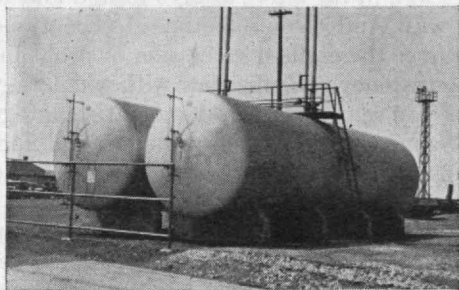
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THE INSTITUTE GAZETTE

(Concluded from page 550)

Option III: For men who are primarily interested in general construction work, many of whom will wish to become contractors, an option would be established in Construction and Management. More work immediately applicable to practical problems would be given in this option than in the others. Emphasis would be placed on certain business subjects and on the characteristics of construction materials.

Professor Wilbur presented a tentative curriculum for discussion and the following points were brought out:

(1) The suggested curriculum departs from the present curriculum in the third year.

(2) The suggested curriculum makes increased use of subjects taught by other departments and requires the Civil Engineering Department to teach very few new subjects.

(3) A transition to the new schedule would not be too difficult, since students now enrolled would be essentially in Option I of the new curriculum. New second-year students could begin their chosen option at the time the new program went into effect.

(4) This proposal appears to offer more comprehensive training in Civil Engineering than is possible with the present curriculum.

The Committee believes the curriculum proposed by Prof. Wilbur would represent a decided step forward and that the Department should be encouraged to put into effect carefully considered revisions based on these principles.

ADDRESS TO THE GRADUATES

(Continued from page 532)

Now the unions are the target of attack, and the Taft-Hartley bill to regulate them may soon be enacted.

I need not elaborate further on the fact that you have already lived through troublesome but stimulating fluctuations in the political climate of our democracy. You will participate in more of them in the years ahead. May you do your part well in the effort always to find and to follow the better way. And if you sometimes feel confused and discouraged over the endless succession of problems and the lack of consistency and efficiency with which they are handled, may you remember this democratic analogy to the temperate zone, and that such problems and fluctuations make in the long run for social strength, and take courage.

Finally, let me express a thought which is both an encouragement and an appeal to you as you meet and react to the situations ahead. It is this. Your professional training has emphasized, above all else, objective analysis of problems and skillful, constructive solutions to them. There is no place in science or technology for personal prejudice or selfishness; the whole emphasis is on the facts and the conclusions which logically follow. There is no place for half-baked opinions or slovenly performance; the scientist or engineer or architect is expected to speak only when competently informed and to act always with skill and good reason. These things are part of the code of ethics of the technological profession. The major purpose of our education is to create the habits, implant the knowledge, and develop the skills which will insure ob-

(Continued on page 554)

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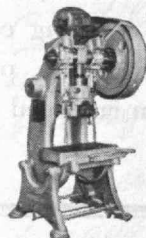
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SAFETY ENGINEERING:

• Do you like spilled gasoline?

The Department of Safety, American Petroleum Institute, included the following in a February, 1947, bulletin:

AUTOMOBILE CATCHES FIRE

"A car was driven into a service station for gas and the engine was left running while the station attendant filled the tank. During the operation the engine almost stopped running and the driver choked it, causing the engine to back-fire and burst into flame.

"The car was destroyed by the fire and the occupants were badly burned — one fatally.

"It is an unsafe practice to allow the engine to run while getting the tank filled with gasoline."

The engine should not be left running. However, a back-fire, of itself would probably not have caused the fatality.

A constructive step would be to correct conditions, now inherent in tank design, which cause the spillage of gasoline.

It is our contention that a well-designed gasoline tank should be capable of receiving the full pumping speed of the modern commercial pump — approximately fifteen gallons per minute — without blowback. The tank should incorporate an expansion zone to provide for temperature changes. The filler neck should discharge at the bottom of the tank — thus eliminating evaporation and excessive vapors during filling.

And finally — the tank should have some positive means to advise the attendant when the fuel has reached a pre-determined level within the tank. That is the function of the VENTALARM* gasoline tank fill signal — now standard equipment on fifteen makes of automotive vehicles. One simple rule suffices — "Fill 'til the whistle stops".

As safety engineers, you can play an important role in the improvement of gasoline tank design. Your comments would be appreciated.

Yours for safe filling tanks,

Frank P. Scully
M.I.T. '15



P.S. And, incidentally, the VENTALARM fuel oil tank signal is now assuring safe filling of over a million home fuel oil tanks.

*U. S. PAT. OFF.

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ADDRESS TO THE GRADUATES

(Continued from page 552)

jective and constructive performance. Such performance in technological matters we take for granted.

I believe that the discipline of objective, analytical, and constructive approach to scientific and technical problems tends to carry these same attributes over into the great variety of nontechnical fields. I believe that men and women, trained as you have been, are more likely than the average person to make honest, unprejudiced and unselfish judgments and are, therefore, more likely to arrive at sound conclusions. I think this is especially likely to be true if you stop from time to time to think about it and check yourself to see whether, in reacting to social or political problems, you are being guided by the requirements of careful analysis and the logic of constructive conclusions.

I would not imply that people with your training have any monopoly of honest judgment, for, thank God, there are many people from many walks of life who have it through conscience and good sense. But the world desperately needs many more people who will react unselfishly and clearheadedly, and who will then act unselfishly and competently. Every problem in industrial relations, in political action, and in international relations calls for such approach by all concerned, and that means by all of us.

One nice illustration of the qualities of which I am speaking was in the leading editorial in last Saturday's *Boston Herald* of June 7. Who wrote it I do not know. He was probably not a scientist or engineer or architect

and I would guess that he was probably educated in our big sister institution up the river. But he did show the quality of unprejudiced analytical thinking that I have in mind when he pointed out the distinction between communism as a social philosophy and the acts of a nation ruled by a particular communist party with its leaders. The editorial went on to say:

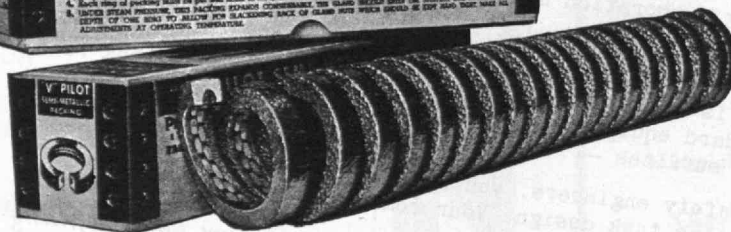
It is not the communism of Russia against which we are forming our front. It is the aggressive nationalism of Russia. That distinction is important. It is no "proletarian democracy" that tried to gouge heavy reparations out of the Italian masses, that is denying the Korean people a chance to realize their destiny, that is looting machinery from Manchurian labor, that is imposing an unequal peace on the Chinese, that is draining foodstuffs from her satellites. If Russia were a capitalist state, and behaved as she has, we should still need to gather our potential allies.

This is just a random illustration which happened to be at hand when I wrote this address. It does not solve the problem of our relations with Russia. It is simply one example of how we can get our emotions and judgments confused by unanalytical reactions to phrases like communism, democracy, the flag, fair employment practice, the world owes every man a living, military strength produces wars, and many others.

The important thing is to understand just what are the facts and causes back of the situations thus described, and then to take the wisest constructive action which is realistically possible. This is what the pure and applied scientist is trained to do in his relatively simple field of professional operations. I hope it is also the type of approach to the

(Concluded on page 556)

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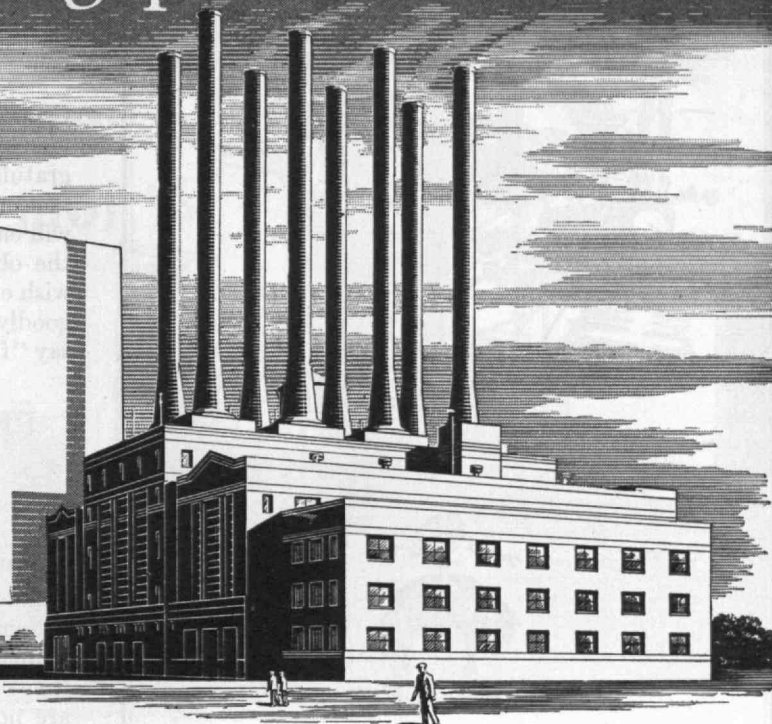
H. S. FITZ GIBBON, Jr., '38
Secretary

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Mere size, of course, makes Rouge Station, located on the River Rouge in Detroit, notable. It has long been the largest steam electric power station serving any industrial establishment, anywhere. But beyond this, Rouge has contributed importantly to the major advances in steam generation.

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In this history-making development of Rouge, the boilers and all related equipment from the first installation through every stage of modernization up to the present were designed and built by Combustion Engineering.

B-135

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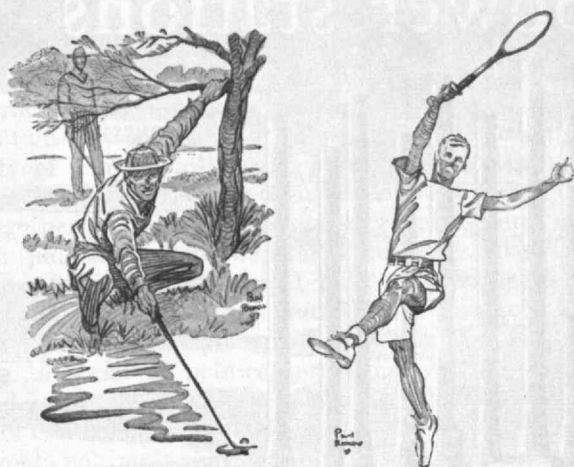
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ADDRESS TO THE GRADUATES

(Concluded from page 554)

more complex problems of community life which you will follow — subconsciously because of your training and consciously because you know that such approach is sound and greatly needed.

So, members of the Class of 1947, on behalf of the Corporation and Faculty of this institution, I bid you Godspeed in your new interests and activities. I congratulate you on the opportunities for growth and satisfactions which will be afforded you by the difficulties you will encounter. I trust that you will meet all problems in the objective and constructive spirit of science. And I wish every one of you every well-deserved success, with a goodly share of good luck thrown in for good measure. I say "farewell" to you as students; I greet you as Alumni.

PROBLEMS OF ATOMIC ENERGY COMMISSION

(Continued from page 530)

In illustrating the job to be done, it may be useful to consider the responsibilities of the Commission's field manager. He is responsible for the administration of the Commission's operations at Oak Ridge. These include the management of a city of 40,000 people, entirely owned by the Government and for which city management services are now furnished by a contractor. The contractor, in turn, lets concessions for numerous community services and stores, maintains all the community property, issues leases, collects rent, furnishes the fire and police forces, and handles a multitude of other operating and administrative problems for the community. This contractor operates under the direct and close supervision of the field manager and his staff. The field manager represents the Commission in dealing with the contractor operating the Clinton Laboratories — a large research and development laboratory and isotope production factory — and administers the contract for the operation of the gaseous diffusion plant and the electromagnetic separation plant. Together, these two plants represent an investment of \$900,000,000. The field manager and his staff must insure that these operations are carried on with proper fiscal and inventory control of the precious material, and that the plants are operated efficiently and in accordance with production schedules and requirements of the Commission as a whole. He is also responsible for the maintenance of security at these plants and laboratories, and for the promotion of satisfactory industrial relations, and must provide the community with satisfactory government.

To administer such responsibilities, the field manager needs a broad delegation of authority. He must, however, be sensitive to policy questions and always have in mind that his operation is one of a series of integrated, interdependent steps in the over-all operations of the Commission. This job is large by any standard. It holds a great challenge and should attract the highest type of administrative talent, despite inability of the Commission to pay salaries which compete with those paid by private enterprise.

Another position of great importance is that of director of security on the staff of the general manager in Washington. The director of security will be responsible for the

(Continued on page 558)

ETHYLENE

**recoveries over 90%
purities over 95 mol %**



100,000 pounds of ethylene per day are produced by this plant, designed and built by The Lummus Company.

...without low-temperature refrigeration

In 1943 Lummus completed construction of an ethylene plant for one of the nation's best known chemical companies. With this plant (the first to employ the absorption process for the purification of ethylene) the company has consistently obtained high ethylene recoveries (over 90%) and purities (up to 95 mol %) without use of extreme low-temperature refrigeration.

Among other basic advantages which Lummus incorporated in this plant are flexibility, economical resolution of the charge and furnace effluent gas streams, and ease of control.

Lummus is currently completing construction of two similar ethylene plants with even higher purity—99+mol % ethylene.

With complete research and construction facilities—and with broad experience in petroleum refining and chemical production—Lummus is well prepared to design and build your facilities for the production of ethylene, propylene, phenol, and other chemicals from petroleum.

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PROBLEMS OF ATOMIC ENERGY COMMISSION

(Continued from page 556)

formulation and recommendation to the Commission of security policies for the entire atomic energy program. Not only must he act in accordance with the security provisions of the Atomic Energy Act of 1946, but, to the best of his ability and judgment he must also institute all precautions and safeguards necessary for the protection of facilities, materials, and information of vital importance to the common defense and security of the United States.

The Commission's work is carried on in several hundred places. Each of them has to be protected. Every employee of the Commission and its contractors who, in the course of his work has access to classified information or equipment, must be fully investigated by the Federal Bureau of Investigation. The director of security is responsible for the establishment and prompt operation of the Commission's part in this enormous investigative activity. He has responsibility to the Commission for recommendations regarding the employment of personnel. He must co-operate with the Federal Bureau of Investigation and other agencies in the detection of violations of the provisions of the law relating to security.

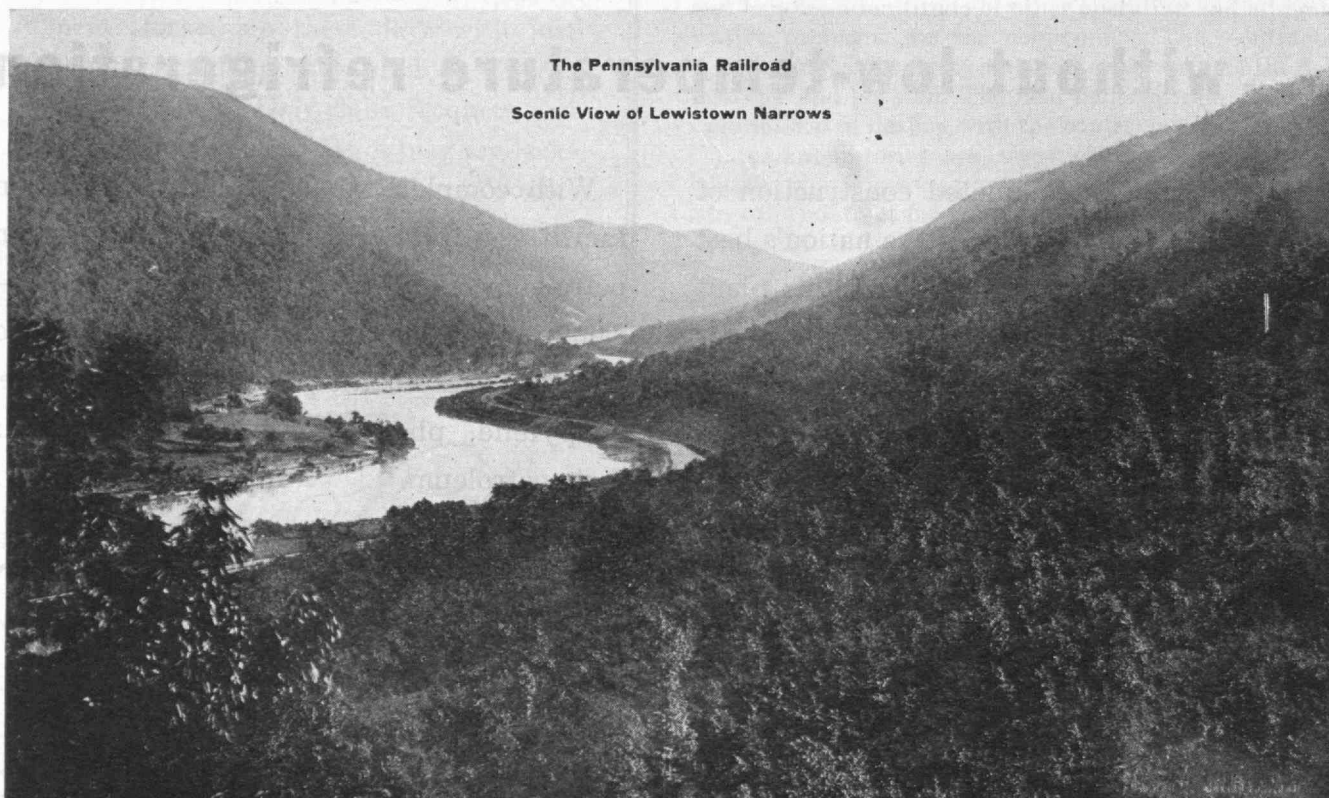
Under the Act, the Commission is directed to activate "the policy of the people of the United States, that, subject at all times to the paramount objective of assuring the common defense and security, the development and utilization of atomic energy shall, so far as practicable, be directed toward improving public welfare, increasing the

standard of living, strengthening free competition and private enterprise, and promoting world peace." It is further directed to conduct research and development to build a "program of Government control of the production, ownership, and use of fissionable material to assure the common defense and security and to insure the broadest possible exploitation of these fields." This is quite an order. The Commission must utilize the best practices of free enterprise and of government. It must establish programs which will reconcile widely differing practices among private employers and between the Federal service and private business. This must be done without destroying or subjugating the rights and privileges of the employee or the employer. In order to do its job, the Commission must obtain personnel of exceptional qualities, capable of developing new patterns of co-operation between the Government and private organizations.

The Commission must endeavor to minimize differentials in relation to salary and wage policies among those of its contractors who conduct similar operations. Moreover, to avoid loss of Commission employees to contractors, the personnel policies and salaries paid by the Commission must, in so far as possible, be adjusted to meet the competitive pull of private employers with whom the Commission is dealing on a very wide variety of problems.

A major task of the Commission itself, which will call for great imagination, inventiveness, appreciation of industrial motivation, and shrewdness, is the discovery and development of incentives to industry to devote some of its best people and energies to various aspects of this

(Continued on page 560)



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PROBLEMS OF ATOMIC ENERGY COMMISSION

(Continued from page 558)

broad program. At this stage in the development of a new art, the expenditures required for further research and development are large, and the prospects of commercial profit are difficult to appraise. As contrasted with the war period, industrial firms are naturally, and rightly, motivated by profit incentives. The stockholders expect industrial firms to make money, and so do the employees. Management, therefore, has a responsibility to devote the energies and resources of a company to those activities which hold prospect of fair and reasonable profit.

If, in this country, we are to exploit fully the possibilities which atomic energy holds in store and to provide a broad and strong foundation for this exploitation, we must create what might be called an atomic industry. This is important not only for the commercial possibilities which will certainly be developed, but also for our common defense and security. The building of an atomic industry calls for the closest kind of partnership between the Commission and industry. There is very great responsibility on both parties to evolve together the patterns which will promote the growth of industrial strength in this field.

In the future, when the necessary power reactors are able to generate electric power economically, we may be sure that the necessary power reactor will consist of a great many components. It will be very much more complicated than any present-day boiler. It will include the reactor itself made of special materials; there will be

a number of auxiliaries, such as pumps, seals, blowers, valves, coolants, heat exchangers, and a great array of instruments for accurate control. It will be housed in buildings of special design; it will include associated chemical separation and recovery equipment. There will be numerous safety devices to insure the safe control and operation of the reactor. All of these parts, as well as the design and building of this assembly, should be done by industry. There should be enough firms with the knowledge and capacity to provide lively competition among them in the production of the best and cheapest components. Other uses are certain to be found for many of the products originally developed for the new atomic industry. New materials, upon which successful design and construction of power reactors depend in such large measure, will be developed, and we may be sure that most of these will have many other useful applications in industry.

We must bring about a very wide participation by many institutions in advancing knowledge by research and development, for we are continually bumping up against the frontiers of scientific knowledge. Similarly, in the development, design, construction, and operation of the reactors of the future, there must be a wide participation by American industry. Only if this enterprise is one in which broad segments of the whole American economy participate will it be possible soundly and quickly to go forward toward the realization of the great potentialities which atomic power must hold.

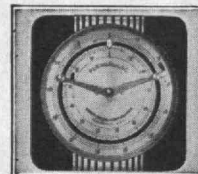
Much experimentation is involved in discovering ways in which industrial groups may be brought into a solid

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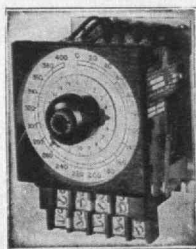
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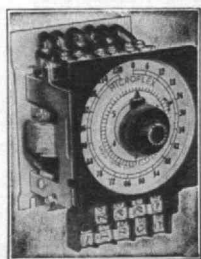
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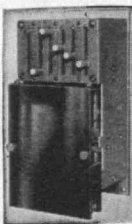
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PROBLEMS OF ATOMIC ENERGY COMMISSION

(Continued from page 560)

participation in this enterprise. Some of the hurdles are clear, such as those growing out of security restrictions. The way is largely uncharted; there is no book of answers and few precedents to use as guides. Mistakes will be made, but we must go forward. Unless we try many new administrative devices with full knowledge that some will bring criticism and others will fail, this enterprise will be mediocre and fall tragically short of the expectations and requirements of the American people.

Of all these problems probably the toughest is security, for here the pitfalls are deepest and the guideposts practically nonexistent. As Americans you expect that our secrets will be safely kept until we are assured that satisfactory international controls are established. You also expect that progress in atomic energy will go ahead rapidly, for you know that this nation must maintain a position of leadership. Yet these expectations are, in a sense, quite conflicting, and give rise to a dilemma not easily resolved.

For maximum protection of our present secret information we might lock up every bit of knowledge we have and impound every new idea our scientists produce. In this freezing of the present status of knowledge, we would create a sort of informational Maginot line. On the other hand, to achieve the most rapid scientific and technical progress we might make our present secret information generally available in the conviction that freedom of discussion and prompt publication of scientific results are the lifeblood of scientific advance. Neither of these courses is acceptable and we must find some reasonable balance between them. This, I assure you, is no easy task.

I have probably said enough to indicate the kind of complex problems which the Atomic Energy Commission must resolve promptly, soundly, and by democratic methods. This calls for building a staff of the most competent men we can find. They must have integrity, judgment, imagination, and courage. They must prove themselves capable of resolving many issues and giving impetus to the enterprise upon the success of which so much depends. This project must succeed.

We need talent from many fields — men who are flexible yet experienced as comptrollers, budget officers, personnel directors, industrial relations experts, lawyers, engineers, scientists, and administrators. The numbers needed are small, but their talents must be exceptional. Many thousands have applied to the Commission for employment and among them we will find some to fill the posts. Very often, when we find just the right man he is in a position from which he cannot easily be spared, for others have already discovered his talents and have put him in a key place. Such men, or their employers, may be inclined to offer many reasons why someone else should be found. Unless such an attitude is the exception, rather than the rule, this enterprise will be mediocre and therefore a failure, and the price of failure may well mean the loss of leadership of this country in world affairs. It could even mean our eventual decline to a position of a second-rate power with the train of tragic circumstances which would surely follow. Or failure might come about in another way. The Commission might succeed temporarily

(Concluded on page 564)



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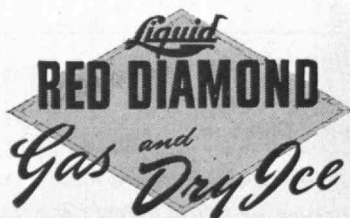
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AR-16 Coils, End Link, Center Link or Swinging Link.

Net price.....\$1.15 (Include PB-16 Plug)

PB-16, Plug in Base Only.....Net price.....\$.27

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The HRT is a new plastic tuning knob with a chrome plated appearance circle. The HRT knob fits a $\frac{1}{4}$ " diameter shaft and is $2\frac{1}{8}$ " in diameter. Available in Black or Gray.

HRT Knob.....Net price.....\$.75

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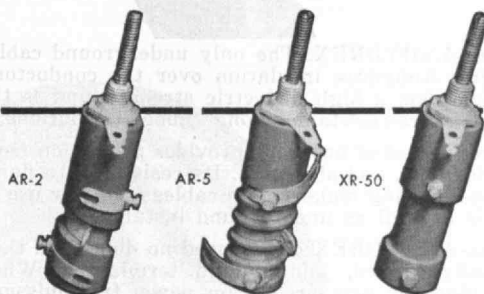
HRS-1 Knob.....ON-OFF through 30° rotation.....Net price.....\$.51

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AR-2 High Frequency Coil.....Net price.....\$1.71

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PROBLEMS OF ATOMIC ENERGY COMMISSION

(Concluded from page 562)

in a material sense but in so doing undermine our system of free enterprise and some of our most cherished civil liberties.

I remember well the day in June, 15 years ago, when, as a member of the graduating class, I received my diploma from President Compton. It was a time of crisis in this country and throughout the world. We were in the depths of the most severe economic depression. Signs were plentiful that the members of the Class of 1932 were not going to have an easy time. We knew we would have to work hard—that each in his own way would have to find his opportunity not only to make a living but also to improve the environment in which we live and work.

I am sure that the Class of 1947 has few illusions that men can live privately any longer. Many of them have served in the most costly and bloody war in history, which has been succeeded now by an uneasy peace in which deep conflicts between the victors are starkly evident. As we survey the condition of affairs, both domestic and international, the patterns of behavior, the tools of action are, on the whole, sadly conventional. The most significant new thing in this scene is atomic energy—a force which holds awesome possibilities for good and for evil. Most people sense that the development of atomic energy will, and already has, profoundly affected the framework in which they live and work and that we have seen only the beginning of these effects thus far. We and our children will see much more.

Perhaps the most prevalent feeling people have in relation to this subject is fear. They have reacted to its fearful potentialities as a weapon and the prophets of doom have not let them forget what atomic warfare might mean to them or their children. People feel uneasy about the effects of the development of atomic energy—on their business, on their jobs. And they wonder what they as individuals can do about it.

There are quite a few things they can do about it and in time there will be many more. As M.I.T. men there are things that you can do about it. First of all, you can try to understand better what "it" is. It is not so abstruse but that with your background and a moderate amount of effort you can understand a good deal about the principles and problems of atomic energy. As some grasp of the essentials is gained, the mystery diminishes and with it the unreasoned fear felt by so many. When understanding is gained it should be passed to others.

There are other things you can do. The Commission needs your help in finding the men whose services are required to make this enterprise a success. If such men are now employed by you, we need your help, even your sacrifice, in enlisting their interest and participation in this great task.

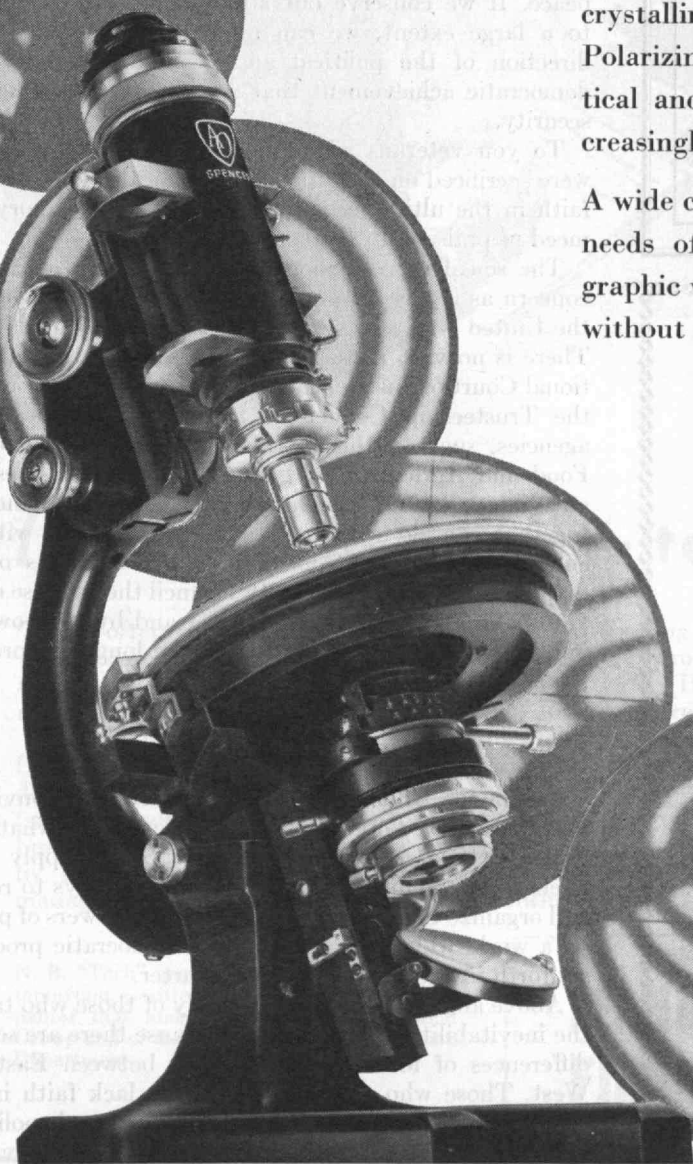
We face the world's most exciting and momentous experiment in a partnership between government and private organizations in the development of an unparalleled resource. Our task carries a responsibility second only to that of the armed forces for the common defense and security of the United States. This enterprise belongs to the American people who must individually and collectively bear responsibility for its success and support.

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Hugo H. Hanson, Class 1912
Charles J. Fisher, Class February, 1946

UNITED NATIONS COMMENCEMENT

(Continued from page 534)

of sovereignty; yet the United States Government and its peoples have always been most loath to derogate their precious independence. We ask for genuine safeguards that the atom bomb will never be used against any nation; yet we are today the sole possessors of it and the most able of any nation to develop its potentialities. We ask that all nations, for the common good, join in the peaceful development of atomic energy; yet we today have a monopoly in this field and for years to come could probably keep the leadership in this development.

It may be that we shall make little apparent progress for some time to come in these negotiations and in the related negotiations on the regulation and reduction of conventional armaments. But even if this proves to be the case, I am certain that continued study and discussion will, in themselves, bear fruit in the end.

We should never permit ourselves to be driven into inaction or despair by apparent stalemates. The United States, with half the productive power of the world, has decisive power to create the conditions of permanent peace. If we conserve our strength and use it rightly, to a large extent, we can influence the world in the direction of the political and economic stability and democratic achievement that are essential to collective security.

To you veterans whose best years for academic life were sacrificed on the altar of freedom, this expression of faith in the ultimate consolidation of your victory is a meed of praise and thanks.

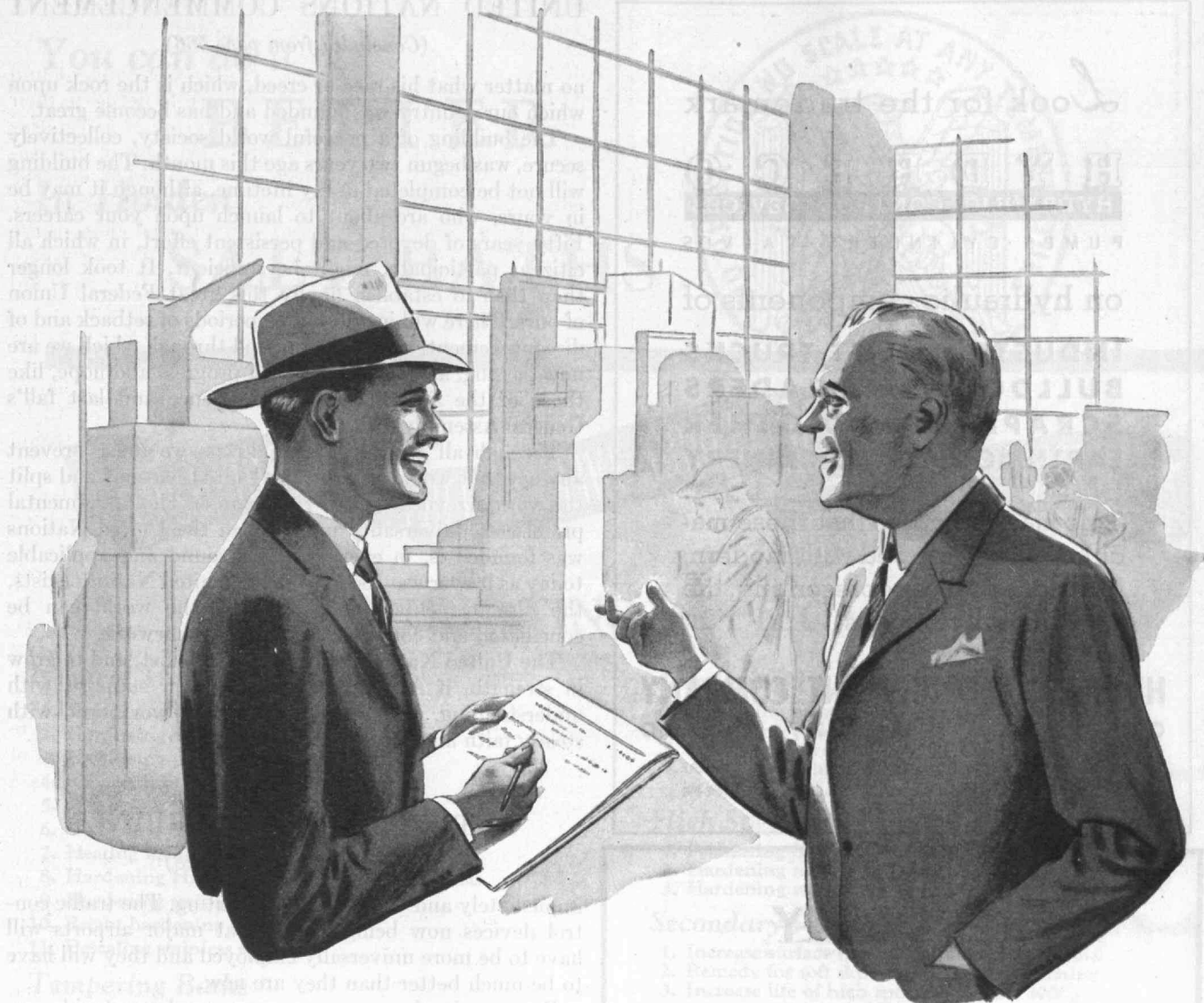
The so-called veto should not be so great a cause of concern as it has become. There is no veto anywhere in the United Nations except in the Security Council itself. There is no veto in the General Assembly, the International Court of Justice, the Economic and Social Council, the Trusteeship Council or in any of the specialized agencies, such as the World Bank and Fund and the Food and Agriculture Organization. Through these institutions, nations which are ready to plan and act together can do whatever they decide to do with an enlightened world opinion behind the decisions of the majority. Even in the Security Council the exercise of the veto is limited both by the charter and by the power of public opinion. No nation can, in the long run, prevent the achievement of the majority will.

Organization of Efforts

We, in the United States, must assert the conviction that we can do co-operatively and by agreement what must somehow be done — that we *can* peacefully apply what science has taught us — that we *can* find ways to realize and organize the productive and creative powers of people on a world-wide basis through the democratic processes set forth in the United Nations charter.

Above all, we must reject the folly of those who talk of the inevitability of another war because there are serious differences of ideology and interest between East and West. Those who talk in these terms lack faith in the capacity of America to exert her great moral, political, and economic strength in behalf of peace. They have lost or forgotten that faith in man and his capacity for good,

(Concluded on page 568)



IT TAKES TWO — to prevent loss

TOO often insurance is regarded as a formal agreement of indemnity against loss rather than as being the mutual effort of management and underwriter to protect against and prevent loss.

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UNITED NATIONS COMMENCEMENT

(Concluded from page 566)

no matter what his race or creed, which is the rock upon which our country was founded and has become great.

The building of a peaceful world society, collectively secure, was begun two years ago this month. The building will not be completed in my lifetime, although it may be in yours, who are about to launch upon your careers. Fifty years of devoted and persistent effort, in which all citizens participate, might be sufficient. It took longer than that to establish finally this great Federal Union of ours. There will inevitably be periods of setback and of discouragement, such as the period through which we are now passing, as well as periods of progress and hope, like those of the San Francisco Conference and last fall's General Assembly.

Through all these ups and downs we must prevent any act that would destroy the United Nations and split the world irrevocably into rival camps. The fundamental premise of universality upon which the United Nations was founded is, in every way, as sound and applicable today as it ever was. So long as the United Nations exists, the disagreements and rivalries of the world can be conciliated and contained within its framework.

The United Nations will continue to exist, and to grow in strength, if Americans will give their support, with understanding, with sacrifice and hard work, and with steady faith and zeal.

FUTURE OF GAS TURBINES

(Continued from page 528)

immediately and cannot be kept waiting. The traffic control devices now being installed at major airports will have to be more universally employed and they will have to be much better than they are now.

Bumpy air gives passengers an unpleasant ride, especially at high speed. As speeds have increased, such unpleasantness has been minimized by concurrent increases in wing loading made possible by more efficient high-lift devices. It is probable that the limit of improvement has been approached in this respect. But if not, and if something like boundary layer control is developed which gives a large increase in maximum lift and thus permits reduction in wing area, there will immediately arise difficulty in finding enough room in these smaller wings for the large fuel loads which jet airplanes require. It is possible, therefore, that the limit on speed will be set by the comfort of the passenger rather than by the power of the engines.

Of course, jet engines do have advantages as far as the comfort of the passenger is concerned. They are smooth, the noise of the propeller is absent, and the noise of the engine is rather easily dissipated and insulated against.

The turbine engine with propeller, as distinct from the pure jet, may be expected to come into the commercial field as a replacement for the reciprocating engine in planes very similar to the ones we have today, unless considerable improvements in the latter type of engine give the reciprocating engine a new lease on life.

The gas turbine undoubtedly has a great future in the field of aviation. At present it is too expensive and it has

(Concluded on page 570)

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HEAT TREATING APPLICATIONS

Neutral Hardening Baths

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2. Hardening tool steels
3. Hardening production parts
4. Spheroidizing or annealing steel
5. Hardening SAE steels
6. Annealing carbon steels
7. Heating medium for spinning and forming
8. Hardening High Carbon High Chrome steels
9. Hardening stainless steels and cutlery
10. Bright hardening stainless steels
11. Descaling stainless steels

Tempering Baths

1. Solution treatment of aluminum alloys
2. Tempering production parts and tool steels
3. Hardening Beryllium alloys
4. Martempering production parts
5. Age hardening aluminum alloys

Austempering, Martempering and Isothermal Baths

1. Hardening tool and SAE steels
2. Annealing SAE steels
3. Controlled quenching to eliminate distortion
4. Quenching SAE steels
5. Austempering
6. Hot quenching stainless steels
7. Quenching production parts

Annealing Baths

1. Annealing brass and copper
2. Annealing nickel silver
3. Annealing silver
4. Annealing gold and platinum, and other precious metals at above 1000° F.

High Speed Steel Baths

1. Preheating high speed steels
2. Hardening tool steels
3. Hardening steel production parts

Secondary Hardening of High Speed Steels

1. Increase surface hardness of high speed tools
2. Remedy for soft skin due to faulty hardening
3. Increase life of high speed steel tools 300%

Bluing and Blacking Baths

1. Bluing and blacking production parts

Bright Temper and Descaling Bath

1. Bright tempering steel parts
2. Descaling steel parts

Carburizing Baths

1. Rapid carburizing from 0.001-0.040" depth
2. Rapid heating of dies, etc., for hardening where soft skin occurs
3. Carburizing to a depth of 0.050" or more

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1. Copper
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3. Silver

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WRITE FOR BULLETIN TR-125

• HAIG SOLAKIAN, Sc.D., '17, Vice President

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FUTURE OF GAS TURBINES

(Concluded from page 568)

not been sufficiently developed for commercial use. It is presently too sensitive and skittish, too subject to sudden vapors and collapses. But given the kind of facilities represented by laboratories at M.I.T. and others elsewhere, and given the degree of financial support required by the magnitude of the development task, the gas turbine will find its true place of importance in tomorrow's aviation.

AIR TRANSPORTATION

(Continued from page 526)

and operate than is now true in the case of the highly developed reciprocating engine.

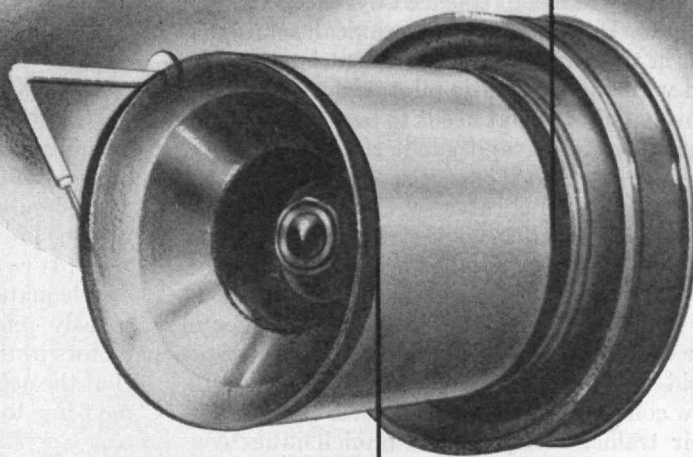
I need not tell you that the British originally developed the turbo-type engine. Several of their manufacturers are in the midst of big turbo development programs, backed by their government. They have a balanced and comprehensive plan for the design of turbo-engined air liners—not only on paper but in process. The engineers of the principal British air line are already thinking readily in terms of operating technique for jet-propelled commercial aircraft. I believe the British are capable of putting jet air liners into regular service within five years. No such program, for commercial aircraft, exists in this country today, although there is good raw material in the form of military jet development. We must remedy the deficiency without delay, and the first step is to see that our air lines are in sufficiently sound financial condition to permit them to place the necessary orders with domestic aircraft manufacturers. Two years from now will be too late.

Airports and Airways

As any motorist knows, there is no use building a bridge unless its approaches can handle the traffic. The airplane is no different. Regardless of its efficiency, the air liner cannot serve the mass market unless there are aids on the ground which will not only guide it accurately from point to point but will also assure the safe and orderly flow which we see in the block system on a railroad. Generally speaking, the machinery for the block system of the air is technically within reach. Less clear is agreement on how to pay for it. Some groups urge that the cost be absorbed directly by the air lines. This is beyond the financial capacity of the air lines. As distinct from the rails, the Federal airways are not used exclusively by the scheduled air lines. A highly developed domestic airways system is vital to the armed forces. From the broad viewpoint, the only possible conclusion is that airways development must be pursued aggressively by the Federal Government. In the future consideration can be given to the possibility of assessing charges to the users.

The topic of airways properly includes mention of facilities for operating under adverse weather conditions. There is no real problem in the all-weather operation of a single airplane; an M.I.T. alumnus, James H. Doolittle, '24, proved that almost 20 years ago. Certain special military transport operations have reaffirmed the fact in recent months. The actual problem is that of handling

(Continued on page 572)



THEY CALLED IT *"Revolution in Rayon"*

For years, rayon technologists knew that their traditional processing methods of handling the spun thread in package form resulted in irregularities in viscose yarn. But all their efforts to completely eliminate the undesirable results proved fruitless—until the answer was found at Industrial Rayon Corporation by a group of chemists and engineers headed by a resourceful M.I.T. Alumnus.

Dismissing all traditional views, these men conceived, labored over, and developed what Fortune Magazine, in the issue of September 1946, called a "Revolution in Rayon."

Their ideas resulted in a method whereby each rayon thread was treated continuously throughout each step of the manufacturing process. Each of the separate package operations of the conventional systems—viscose spinning, washing, desulphuring, bleaching, treating, drying, and twisting—were combined into one continuous thread processing operation.

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The Continuous Process is only one of Industrial Rayon Corporation's distinguished contributions to the synthetic fiber industry.

These accomplishments have not only pushed forward the frontiers of rayon technology but have also advanced the chemical and engineering techniques of related industries. The new Continuous Process has been adopted by rayon producers the world over through purchase of patent rights.

Industrial Rayon Corporation invites Chemists and Engineers, who may be interested in becoming associated with its expanding organization, to submit their inquiries and resumé.

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AIR TRANSPORTATION

(Continued from page 570)

large numbers of passenger schedules under instrument conditions at the same rate as in clear weather. Regularity of schedules and punctuality of operations are basic problems of air line operations. Under present conditions, from time to time a small but significant percentage of air line passengers are inconvenienced by uncertainty of scheduled flights. Here again, the technical solution is within reach, in the form of the instrument landing system, coupled with the automatic pilot, radar, and high-intensity runway lights. What needs to be done is to buy the equipment, pay for it, and get it running. Government agencies must see to this.

The final problem in this category is that of airports. While you have all experienced the discomfort of outgrown, inadequate, badly kept municipal air terminals throughout the country, you may not have realized that much of the poor service attributed to the air lines in 1946 was due directly to these very circumstances on the ground. World War II had prevented the cities from undertaking new construction to accommodate the vast new volume of air traffic. Many of the municipalities concerned had not yet been convinced that it was to their own best interest to invest the money, even against self-liquidating leases from air lines and airport concessionaires. The position of the air lines is that a public airport is comparable to other public works, such as streets, bridges, and harbor improvements, which bring commerce, population, payrolls, and taxing power to the

municipality, and, that an aggressively managed airport can develop the major portion of its needed revenues from sources other than the air lines. The air lines expect to carry a fair share of the cost, but they cannot carry the whole burden. Fortunately, these problems are being solved one by one, as we can see here, in the Commonwealth's admirable development of Logan Airport. Within a few years the air traveler will see a vast improvement in airports throughout the country.

Safety

The matter of air line safety is important, but can be dealt with in a few words. Safety is relative. I know of nothing which is absolutely safe. Certainly two of our most common occupations, riding in automobiles and doing housework, are relatively unsafe. Riding on scheduled air lines today is very safe compared to most occupations. It can and will be made much safer. The provision of adequate airports and airways, to which I have previously referred, will remove many of the underlying factors in the air-line accidents of recent years. I believe that the accident rate will drop virtually to nil within the next five to ten years.

International Relations

In the international aspect of air transportation we see in sharpest focus both the opportunities and the problems of commercial air transportation.

It is axiomatic that the United States occupies a position of vast responsibility and power in the world today.

(Concluded on page 574)

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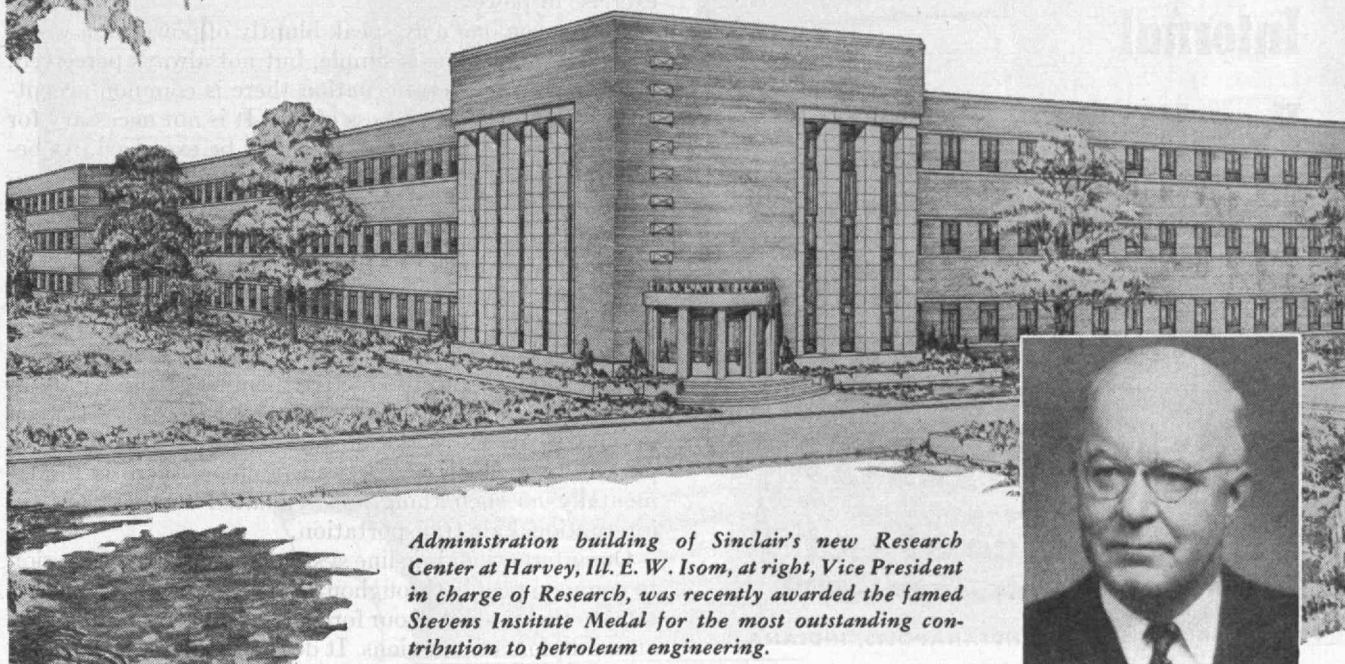
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AIR TRANSPORTATION

(Concluded from page 572)

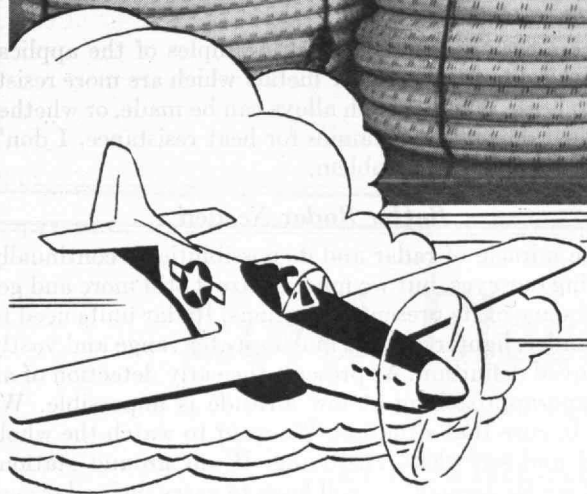
We are going to have to grow rapidly in our appreciation of what this means. Where international affairs are concerned, we in this country are somewhat prone to indulge in wishful thinking. While our ideals of freedom, fair play, and the dignity of man are the priceless catalyst for our actions, we live in a real world of real people. Leadership in a world of sovereign nations requires the sophisticated exercise of power.

The reason one may speak bluntly of power in a world of sovereign nations is simple, but not always perceived. Within any democratic nation there is common acceptance of the orderly process of law. It is not necessary for anything more than police power to be exercised. As between nations, on the other hand, there is not this common acceptance of a legal system whereby the rights of all individuals and groups are reconciled. Adjustments between nations must be achieved by negotiation, leadership, and the beneficent use of strength. It is therefore necessary that each nation seek to remain strong in those respects which are most necessary for its functioning as an independent and productive member of the family of nations. To put the nature of this relationship between nations in terms of the air-line business, and to use a phrase with which you are all familiar, there is fundamentally no such thing as "regulated competition" in international air transportation.

Our international air-line system is a tangible expression to common people throughout the world of America. It is vital to the conduct of our foreign trade and to the support of our diplomatic missions. It does not stop at the boundaries of the oceans as do our American flag steamships. It is seen and its influence is felt by people throughout the world, frequently in remote locations. Indeed, citizens of foreign countries who have never seen a train or steamship are regularly employed to work on air liners carrying the flag of the United States. The skill, efficiency and integrity with which the business of our international air-line system is conducted, and not least of all the personal conduct of our flight crews, have a profound effect on American prestige abroad.

It is plain that the first aim of our air-line system abroad should be that of peaceful commerce. No one here would doubt that the best way to operate this system is with private capital, under private management, with profit as a legitimate motive, and with the public utility concept of public convenience as the principal criterion.

The thought I wish to leave with you is that a strong international air-transport system, flying the American flag, is an absolute essential to the part which we have to play in the world. In my opinion, the proper exercise of power requires the avoidance, and not the attainment, of domination; the desirability of other peace-loving nations participating equitably in international air commerce cannot be doubted. On the other hand, the United States cannot afford to lose its position of leadership on the air routes of the world as we did on the high seas after the era of the sailing clippers. We must, therefore, bring into fine co-ordination the elements of science, engineering, economics, and diplomacy which, taken together, are the essence of success in air-transportation — today and tomorrow.



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Leon P. Brezinski, '29
Richard L. Berry, '30
John Demo, '35



- No brush
- No lather
- No rub-in

RESEARCH FOR NATIONAL DEFENSE

(Continued from page 524)

We need lighter, tougher, and more heat-resisting metals. Suppose that our pistons could stand a temperature rise of a few hundred degrees to enable us to utilize 50 per cent of the power in our aviation engine fuel instead of about half that amount as at present. Our B-29 bomber would then go twice as far as it does now or could achieve its present range with a saving in fuel weight alone, of more than nine tons. In the structure of the airplane itself, lighter and tougher metals will save us much weight which can be put into more fuel, more bombs, more people, or more freight.

With greatly increased speeds, we need much higher rates of fire and much higher muzzle velocities in our aircraft machine guns than we have at present. Before those increases can be made we must have metals that will stand up under the terrific heats generated by pushing bullets through the machine gun barrels at the rates we want. The development of our ordnance is already far behind the development of our aircraft.

We need metals of better conductivity to save weight in our electric wiring systems and our generators. When we realize that the wiring in the modern airplane is measured in miles, it is easy to see that a substantial saving is possible in this field alone.

There are thousands of such examples of the application of lighter and tougher metals which are more resistant to heat. Whether such alloys can be made, or whether we must depend on ceramics for heat resistance, I don't know. That is your problem.

Better Radar Needed

The miracle of radar and its possibilities is continually opening our eyes, but we must utilize it still more and get rid of some of its present limitations. Radar units need to be smaller, lighter, have a much greater range and vastly improved definition. At present, the early detection of an airplane approaching at low altitude is impossible. We need to cure that situation. We want to watch the whole world and see what it is doing. If our ground stations can't see far enough, we will have to carry our radar eyes on patrolling aircraft. The speeds of tomorrow's aircraft will make our present warning service not only obsolete but useless. When every nation can see day and night what the rest of the world is doing, it may be impracticable to plan on a war and we may have peace. However, just to counter too many hopes along that line, we need a camouflage against radar. We need to be able to pick up the approach of enemy aircraft but we also need protection against having our aircraft detected. We want to know what our enemy is doing, but surprise is still a powerful ally to have on our side.

Our airdromes are getting too big and it takes the engineers too long to build them for us. We need devices to launch and land aircraft in shorter distances. We need faster means of making an airdrome and we must be able to utilize for landing and take-off any reasonably level piece of ground that is fairly dry without first compacting it and then covering it with concrete or a steel mat.

Our radio equipment is still too big, too heavy and not sufficiently reliable. Its tuning is not sufficiently stable for military purposes and static still knocks it out. The fre-

(Continued on page 578)

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RESEARCH FOR NATIONAL DEFENSE

(Continued from page 576)

quency bands are so crowded now that it is often difficult to get a message through over any distance. Improved circuit design will help immensely but progress along this line is disappointingly slow.

The big hazard of flying today is from fire. In peacetime, the crash too often results in the loss of the entire crew and passengers by fire. Our military aircraft cover their fuel tanks with rubber to keep enemy bullets from setting the tanks on fire in air combat. While of inestimable value in air combat, this covering does not help much in a crash and the weight is a serious penalty. In a B-29, for example, the bullet-proof covering of its fuel tanks weighs more than six tons.

Subtracting Fuel from the Fire

We need a fuel that does not burn except in the engine and which has some of the characteristics of coal. It burns only in the stove. No one ever heard of the coal in a coal truck catching fire just because the driver ran into a tree or a telephone pole. It is even possible to shoot a bullet through a bomb without detonating the T.N.T. and releasing the power contained in it. We desperately need an aircraft engine fuel — solid or liquid — that does not constitute the combat and crash fire hazard that we must now tolerate.

We need better and more efficient fuels with more energy per pound for reciprocating engines, jet engines,

and for rockets. There must be room for still more progress along these lines in spite of the tremendous advances made in the last 20 years.

We hear a lot of talk about engines driven by atomic energy. There is some work being done along that line now but I wonder if we are moving fast enough to insure that someone else does not outstrip us in the race. If we are second in this race, we should realize that, in a future conflict, it is going to be a case of "the winner takes all."

The long-range radio controlled missile of tomorrow must be countered. Not only must we be able to detect the fact that it is on the way but we need quickly to find the frequencies on which it is being operated and then cut in with our own radio control and prevent it from reaching us — the target. We may have to intercept it with a type of target-seeking anti-aircraft guided missile of our own.

We need an automatic position finder giving our guided missiles a continuous position fix, and hooked into the controls so that the explosive charge will be detonated at the exact latitude and longitude of the target. The lack of accuracy at long ranges today makes it impractical even to approach precision bombing unless the bombardier can actually see the target and direct the bombing from his own airplane or from a mother ship for one or more "drones."

Aircraft speeds are about to pierce the so-called sonic barrier. Actually, we know about as much about this new field as the Wright Brothers knew about what they were getting into in 1903 just before they took off on that

(Continued on page 580)

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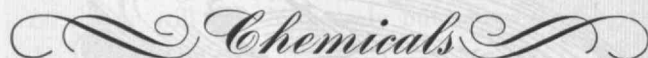
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RESEARCH FOR NATIONAL DEFENSE

(Continued from page 578)

December morning down at Kitty Hawk, N. C. We need a great deal of research on airfoil sections and fuselage shapes which are to fly at velocities greater than the speed of sound. What happens to our aircraft controls at these speeds? Can we trust the human being to operate controls manually and hope that the pilot will not black out every time he touches them? Where are our instruments for the supersonic airplanes? What will happen if you shoot a gun out of an airplane traveling at, let us say, 2,000 miles an hour? Can you open bomb bay doors and drop bombs from a bomber traveling at that speed? The list of questions is endless but the answers are still to be worked out.

What about the use of sound as a weapon? I refer to sounds that are not perceived as such by the human ear but which may have a serious effect on the human system. The familiar dog whistle may give us an example. This sound, inaudible to humans, is heard by the dog but it does not make him happy. His reaction is a nervous one; he is startled into attention. It may be just another newspaper story, but I read the other day of a man who is now being checked over by the British medical people after working in a laboratory testing new jet engines. The story was that his nervous system was out of gear from exposure to sound waves above the range of audibility of the human ear. Conceivably, an airplane equipped with a sort of super dog whistle could fly around a city long enough to upset the nervous systems of the entire population. I believe we need to do some research along this line which may represent just a fantastic dream. It may not.

Light waves offer a similar field. By utilizing wavelengths above the infrared and below the ultraviolet there may be the possibility of developing weapons of future warfare as devastating as the atomic bomb. Other nations may develop them. We must keep pace in order to be able to counter or defend against such threats.

Doing Something About Weather

Weather is a field of research that offers tremendous possibilities. On a limited scale we can already break up clouds and start rainfall where and when we want it. Instead of allowing rain clouds to drive past arid and semi-arid sections, we should be able to shoot them down and put the rain where we need it. If we can extend this process we can stop rain from falling where it has been falling for ages. It is not inconceivable that the nation that first learns to plot the paths of air masses accurately, and learns to control the time and place of precipitation,

(Concluded on page 582)

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WALLACE BLANCHARD, '16, Treasurer**RESEARCH FOR NATIONAL DEFENSE***(Concluded from page 580)*

will dominate the globe. The change of a few inches of rainfall a year in many parts of the world would mean the difference between normal crops and starvation. We must not fall behind in this line of research.

While I have covered numerous points that may seem to imply that our brains should be harnessed to the problem of how to obliterate the whole human race, you will note that practically every one of them can be utilized to benefit humanity and give us a greater civilization. If man is determined to exterminate himself, he probably will succeed. If he tries hard enough, he may even turn this globe of ours into a cinder some day.

If the weapons of warfare become too terrible, that fact may drive some sense into the brain of what we are pleased to call *Homo sapiens* and induce him to find a way of settling his disputes without exterminating his opponent. Gas warfare has not been used since 1918 primarily because it was too easy for both sides to use it and neither combatant dared to risk retaliation in kind. Perhaps when every nation possesses all the diabolical weapons that can be devised they will be afraid to start the slaughter. There is no profit in winning a war if, in the process, you also are destroyed. If the world ever wakes up to the fact that in modern warfare both sides lose, we may have peace.

In the meantime we cannot diminish research. The laboratories of the world are burning the midnight oil these days searching for newer and more deadly weapons. If we fall behind in this race, we will some day find ourselves defenseless. If we neglect our defenses and are unable to protect ourselves and the ideals and principles for which we stand, those ideals and principles will perish and we shall perish with them.

In the councils of nations, the strong are listened to; the weak are ignored. Weakness will not give us peace. It will invite the Four Horsemen — War, Pestilence, Famine, and Death.

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Alumni Day Report

TWO ANNOUNCEMENTS made on Alumni Day were of major importance from the standpoint of the Alumni Fund. First, of course, was the presentation made to President Compton by F. J. Chesterman '05, chairman of the Fund Board, of \$500,000 to assure erection of a Senior House. The first major allocation in the life of the Fund, it was a large part of our accumulated giving over a seven-year period. It also represented a major step in the Institute's long-range development plan as set forth in the brochure "M.I.T. — A New Era."

Every Institute dormitory has been built, at least in part, with funds given by the Alumni. In the past, these funds were raised by periodic, short-term drives for large amounts. Now, the same end result has been achieved by means of a program of giving such that Alumni can gauge the size of their annual gifts by conditions of the moment. From all sides have come expressions of satisfaction at the method as well as this first tangible result.

The second announcement, and in its own way one of real importance, was the gift of the 50-Year Class. The Class of 1897 was the third to make its 50th reunion the occasion for substantially increasing its gift to the Institute through the Alumni Fund. In previous years '97 had done its full share — averaging almost \$2,000, better than 50 per cent more than its quota. At Alumni Day, however, John P. Ilsley, chairman of a special class committee, announced that this year to date the Class of 1897 had contributed in excess of \$33,000. To Chairman Ilsley, Walter Humphreys, and Class Agent Harry Worcester and to all those who co-operated with them so wholeheartedly, the thanks of the Fund Board and of the Institute itself. They have built upon a pattern set by '94 and '96 in a way that will be a challenge to those who follow.

ALUMNI AND OFFICERS IN THE NEWS

Cream of the Crop

☛ HENRY E. WARREN '94, honored by associated electric companies of America in a two-hour program held at the Worcester auditorium on April 20 to celebrate the 30th anniversary of his invention of the Telechron master clock, "which assured the accuracy of modern electric time."

☛ WARREN K. LEWIS '05, winner of the Lamme Medal for 1947, presented in Minneapolis on June 20 by the American Society for Engineering Education "for his great part in the development of chemical engineering in its modern quantitative aspects; for his contributions to its fundamental concepts, and to their many important applications in chemical industry; for the vision, inspiration, and sound methods imparted to his students through the originality and clarity of his thought and writing and through his personal vigor and enthusiasm."

☛ JOHN B. MACNEILL '13, winner of the Lamme Medal for 1946, awarded in Montreal on June 11 by the American Institute of Electrical Engineers "for his foresight, leadership, and creative contribution in the development of switching equipment."

☛ LAWRENCE H. BAILEY '15, recipient on June 4 of the third annual medal of the Stevens Institute of Technology in Hoboken, N.J., "for outstanding achievement in the field of powder metallurgy," having designed the presses which make 90 per cent of all small powder metallurgy parts.

☛ LEO I. DANA '17, given the Jacob F. Schoellkopf Medal for 1947 by the Western New York section of the American Chemical Society on May 20 at Buffalo. Dr. Dana's direction of work on the shipment of industrial gases in large volume made possible during the war the transportation of oxygen from Chicago as far as the West Coast, for the great shipbuilding program dependent upon oxyacetylene gases.

☛ CHARLES A. THOMAS '24, awarded the second Industrial Research Medal at the annual meeting of the Industrial Research Institute at Swampscott, Mass., on June 5 and 6, "for his pioneering and inspiring leadership in the development of the American industrial research system and for his participation thus in American chemical enterprise."

☛ CHARLES S. DRAPER '26, presented with the New England Award of the Engineering Societies of New England

at their 25th anniversary dinner on April 29 at the Boston City Club.

☛ BENJAMIN F. MILLER '28, recipient of an honorable mention and an advance of \$1,000 for the publication early next year of his book, "You and Your Doctor," submitted in manuscript for the national contest on works of science sponsored by the McGraw-Hill Publishing Company.

☛ GEORGE P. WADSWORTH '30, awarded a certificate of appreciation by the War Department for his achievement as a special consultant to the Air Weather Service in the European Theater of Operations and in the United States during the war. The certificate emphasized the value of his contributions to the solution of meteorological problems peculiar to the area to which he was assigned, aiding materially in the achievement of final victory.

☛ CLARENCE H. WILLIAMS '32, winner of a \$1,000 award as one of the top prizes in the Chicago *Tribune's* \$26,250 architectural contest, "Better Homes for Better Living," placing first in the master bedroom competition.

☛ RICHARD A. FLINN '37, winner of the Peter L. Simpson Memorial Gold Medal of the American Foundrymen's Association, awarded at the annual banquet at the Book-Cadillac Hotel in Detroit on May 1 for his "outstanding technological contributions to the metallurgy of chilled and white cast iron."

☛ SCOTT W. WALKER '40, on whom was bestowed the War Department's certificate of appreciation on May 20 "for conspicuous and meritorious scientific services which contributed materially to the successful accomplishment of the research and development program of the chemical corps."

☛ BARBARA GREEN '46, awarded an Air Transport Association prize of \$100 for research in meteorology recorded in a paper on the radiation of fog.

Trend to the Top

☛ With PERCY A. STAPLES '04 now president and chairman of the board of directors of the Hershey Chocolate Corporation.

☛ With LOYD H. SUTTON '08 elected president of the American Patent Law Association.

☛ With H. B. RICHMOND '14 elected chairman of the Scientific Apparatus Makers of America.

☛ With ALFRED H. CLARKE '15 elected a vice-president of the Bemis Brothers

Bag Company, in charge of a newly formed general production department.

☛ With EARL R. MELLEN '16 elected president of the Weston Electrical Instrument Corporation.

☛ With WALTER J. BEADLE '17 named a director of Canadian Industries, Ltd.

☛ With JAMES HOLT '19 elected president for 1947-1948 of the Engineering Societies of New England.

☛ With HAROLD F. SMIDDY '20 chosen to attend the eighth international management congress this summer at Stockholm, Sweden, as associate of consulting management engineers.

☛ With WILLIAM W. RUSSELL '22 elected president of the National Apartment Owners' Association.

☛ With HENRY C. GUNNING '26 made chairman of the British Columbia section of the Canadian Institute of Mining and Metallurgy.

☛ With ROBERT E. MATTSO '26 appointed general superintendent of transportation for the Northern Pacific Railway.

☛ With EDWIN A. NORRIS '27 appointed vice-president of the Aerovox Corporation, in charge of all manufacturing, engineering, and research.

☛ With WILBUR N. LANDERS '30 elected secretary of the Society of Naval Architects and Marine Engineers, of which PARKER H. STARRATT '30 is new secretary of the New England section.

☛ With LEROY F. MAREK '30 elected vice-president of Arthur D. Little, Inc.

☛ With ALEXANDER M. BLAKELY, JR., '34 elected to the board of directors of the Fuller Merriam Company.

☛ With DANIEL J. O'CONOR, JR., '37 made vice-president, assistant to the president, and a director of the Formica Insulation Company, of which JOHN D. COCHRANE, JR., '23, has been appointed director of the research and development department.

☛ With HAROLD L. POSNER '40 named president of the Pallet Sales Corporation.

☛ With GEORGE R. HARRISON, staff, elected chairman of the American Institute of Physics.

Honorary Degrees

☛ For LOUIS S. CATES '02, the honorary degree of doctor of science from Columbia University.

☛ For H. B. RICHMOND '14, the honorary degree of doctor of engineering from Norwich University.

☛ For VANNEVAR BUSH '16, the honorary degree of doctor of science from Columbia University.

¶ For THOMAS K. SHERWOOD '24, the honorary degree of doctor of engineering from Northeastern University.

¶ For CHARLES A. THOMAS '24, the honorary degree of doctor of science from Washington University, St. Louis, Mo.

¶ For JAMES R. KILLIAN, JR., '26, the honorary degree of doctor of laws from Union College, Schenectady, N.Y.

Words from the Wise

¶ By CARROLL A. FARWELL '06, MURRAY H. MELLISH '10, HOWARD J. WILLIAMS '20, WILLIAM L. HYLAND '22, and EDWARD C. KEANE '22, who took part in a symposium on "Engineering in the North," at a dinner meeting of the Boston Society of Civil Engineers in Tremont Temple on May 21.

¶ By LAURENCE C. HART '13, who addressed the Staten Island Real Estate Board at its 32d annual dinner meeting on April 19 at the Richmond County Country Club, Dongan Hills, N.Y., and the National Office Management Association on April 24, its Top Management Night, at Hugo's Restaurant, Stamford, Conn., on "Human Relations in Business."

¶ By RUSSELL H. WHITE '16, who spoke before the Engineering Society of Western Massachusetts on "The Great Pyramid and Its Prophecy," at the Hotel Sheraton in Springfield, Mass., on May 20.

¶ By RALPH J. CROSBY '18, who discussed "Safety as It Applies to Supervision," as part of the Western New York Safety Conference and Exhibit held at the Hotel Statler in Buffalo on April 16.

¶ By NORMAN L. WEISS '23, who spoke on "Flotation" before the Northern California section of the American Institute of Chemical Engineers at the Engineers Club in San Francisco on June 2.

¶ By JAYSON C. BALSBAUGH '24, a paper on the "Power Factor of Electrical Insulating Oils—Significance of and Methods of Testing Stability," and by HOWARD R. STALEY '35 with SIDNEY H. GREENFELD '45, a paper on "Surface Areas of High Calcium Quicklimes and Hydrates," both given at the 50th annual meeting of the American Society for Testing Materials held in Atlantic City, N.J., from June 16 to June 20.

¶ By THOMAS K. SHERWOOD '24, who gave a Research Forum lecture on May 27 in Bayway, N.J., on "The Mathematical Treatment and Mistreatment of Experimental Data." On May 26, Dean Sherwood addressed the Chemical Engineers Club in Springfield, Mass., on "Chemical Engineering and the War."

¶ By PETER L. BELLASCHI '26, who addressed members of the American

Institute of Electrical Engineers in Little Rock, Ark., at the Hotel Lafayette on April 14.

¶ By EDWARD S. THOMPSON '28, who addressed the New York Railroad Club on its annual Electrical Night on March 20 on the subject, "Aircraft Gas Turbines."

¶ By WILMER L. BARROW '29, who spoke on "Pulse Navigation Systems" on April 30 at the international meeting on Marine Radio Aids to Navigation, held at the Hotel Roosevelt in New York City.

¶ By MALCOLM MACG. HUBBARD '29, who gave an illustrated lecture on April 9 before the student body of the Massachusetts State College at Fort Devens, detailing "M.I.T.'s Program in Nuclear Science and Engineering."

¶ By WALDO I. KENERSON '29, who was the principal speaker on April 25 at an open house sponsored by the Mack Park Club in Salem, Mass. Colonel Kenerson's subject was "The New China."

¶ By CHARLES A. BICKING '31, who addressed the May 9th meeting of the Massachusetts Society for Quality Control at the High School of Commerce in Springfield, Mass.

¶ By THOMAS R. SMITH '32, who spoke on "Maytag Hydraulic Seal Development" for the Central Iowa section of the American Society of Mechanical Engineers in Newton, Iowa, on May 7.

¶ By WALTER C. VOSS '32, who, on April 23, addressed the New England Building Officials Conference on "Building Code Trends," on May 6 presided at the research session of a convention of the National Lime Association at Hot Springs, Va., giving a talk on "Trends in Research," and on June 18, delivered the 1947 Edgar Marburg Lecture, on engineering laminates, at the annual meeting of the American Society for Testing Materials in Atlantic City, N.J.

¶ By JOHN A. HRONES '34, who, on April 8, addressed the rayon technical division of Du Pont de Nemours and Company in Wilmington, Del., on "New Horizons in Engineering."

¶ By DONALD F. MACNAUGHT '34, who, under the sponsorship of the Boston chapter of the Society of Naval Architects and Marine Engineers, on May 27 gave a lecture in the Engineers Club in Boston on "Cargo Handling Gear Design."

Books

¶ By KARL T. COMPTON, President, *A Program for National Security*; Report of the President's Advisory Commission on Universal Training (of which Dr. Compton is chairman), United States Government Printing Office, Washington, D.C., 1947.

¶ By LUTHER R. NASH '94, *Anatomy*

of Depreciation; A discussion of utility accounting methods from time to time in effect or proposed by regulatory or utility representatives, with particular reference to recent controversies, published by Public Utilities Reports, Inc., Washington, D.C., 1947.

¶ By RICHARD H. POUGH '26, *Audubon Bird Guide: Eastern Land Birds*, published by Doubleday and Company, Garden City, N.Y., 1946.

¶ By NATHAN G. PARKE, 3d, staff, *Guide to the Literature of Mathematics and Physics*, published by the McGraw-Hill Publishing Company, 1947.

Fizz from the Physicists

¶ At the Montreal meeting of the American Physical Society, held at McGill University on June 19, 20, and 21, the following Alumni and staff members were among those who presented papers:

EDWARD A. SAIBEL '24, "Speed of Propagation of a Fracture Crack in Metals,"

MARTIN DEUTSCH '37, "The Decay of Ag^{110} (200 Day)," and with ARTHUR E. MILLER '45, "The Decay Scheme of Sc^{46} ,"

WILLIAM G. GUINDON, S.J., '38, "The Radial Dependence of the Tensor Force in the Deuteron,"

CHARLES KITTEL '38, "Relaxation Effects in Paramagnetic and Ferromagnetic Resonance,"

KENNETH G. MCKAY '41, with A. J. Ahearn and J. A. Burton, "Conductivity Pulses Induced in Diamond by Alpha-Particles,"

ROBERT G. BRECKENRIDGE '42 and DAVIS W. BEAUMONT '42, with B. T. Matthias, "Single Crystals of Barium Titanate,"

ALBERT S. EISENSTEIN, staff, "Some Electrical Properties of an Oxide Cathode Interface,"

LASZLO TISZA, staff, "On the Classification of Phase Transitions,"

WALTER E. MUTTER, staff, "Rectification Characteristics of an Oxide Cathode Interface."

Technology of Metals

¶ The first annual regional conference to be sponsored by the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers was held in Boston on May 23 at the Hotel Sheraton. Morris Cohen '33 and Carl F. Floe '35 served as chairmen, and the following Alumni read papers:

JOHN T. NORTON '18, on the "Metallurgical Viewpoint,"

IGOR N. ZAVARINE '20, on "Low Expansion Alloys for Glass to Metal Seals,"

PETER P. ALEXANDER '33, on "Titanium Copper,"

ROLLAND S. FRENCH '38, on the "Fatigue Properties of a Duplex Phase Aluminum Bronze,"

JOHN C. FISHER '45 on the "Mechanical Viewpoint."

Radio

¶ In the New England radio engineering meeting of the Boston and Connecticut Valley sections of the Institute of Radio Engineers, held at the Hotel Continental in Cambridge on May 17, the following Alumni and members of the staff participated:

H. B. RICHMOND '14, as toastmaster at the banquet,

JULIUS A. STRATTON '23, as chairman of the morning technical session,

W. HERBERT METTEN '36, on the "Commercial Design of Geiger-Mueller Counter Tubes,"

WILLIAM G. TULLER '42, FRANK P. ZAFFARANO, staff, and WILLIAM C. GALLOWAY, staff, on "Recent Developments in Frequency Stabilization of Microwave Oscillators,"

DONALD B. SINCLAIR '31, WILLIAM H. RADFORD '32, and LUCIUS E. PACKARD '35, as chairmen of the regional planning conference.

Purposeful Prose

¶ By THOMAS C. DESMOND '09, in the *New York Times Magazine* for June 15, an article entitled, "Can We Get Traffic Out of Its Jam?"

¶ By RICHARD G. BERGER '16, a pamphlet published by the author, "To Prevent Cancer."

¶ By ERIC F. HODGINS '22, in *Fortune* for April, an article on the underground combustion of coal for conversion to gas, "The Fuel Revolution."

¶ By JANE M. DEWEY '25, in the *Journal of Applied Physics* for June, a paper on "The Elastic Constants of Materials Loaded with Non-Rigid Fillers."

¶ By HOWARD A. ROBINSON '30, with S. L. Dart and Eugene Guth, in the *Journal of Applied Physics* for May, a paper on the "Elastic Properties of Cork. III. Hydrostatic and Ordinary Load-Compression Curves for Cork."

¶ By JOSEPH S. LUKESH '36, in the *Journal of Applied Physics* for June, a paper on "Crystal Pattern Synthesis by an Approximate Summation of Fourier Series."

¶ By JOHN H. DANIEL '40, with E. E. Hanson, in the *Journal of Applied Physics* for May, a paper entitled "Instrument for Measuring Particle Diameters and Constructing Histograms from Electron Micrographs."

¶ By ELIAS BURSTEIN '43, in the *Review of Scientific Instruments* for May, a paper on "The Approximate Determination of Piezoelectric Properties by measurements on Small Crystals."

¶ By CECIL E. HALL, staff, in the

Journal of Applied Physics for June, a letter to the editor on an "Objective Aperture System for the Electron Microscope."

Guggenheim Fellowship Award, 1947

¶ For JOHN S. STEVENSON '34, who will make a petrographic and mineralogical study of igneous rocks associated with some British Columbia Coast Range ore deposits, with special reference to the correlation of ore deposits with features of igneous rocks.

DEATHS

* Mentioned in class notes.

- ¶ CHARLES H. HEUSTIS '76, April 28.
- ¶ WILLIAM L. HALLETT '77, March 30.*
- ¶ HENRY F. ROSS '82, April 27.
- ¶ EDWARD L. TUTTLE '83, May 19.
- ¶ WILLIAM H. EDDY '85, date unknown.
- ¶ MORRIS L. GREELEY '85, November, 1945.
- ¶ WILLIAM M. TAYLOR '86, April 25.
- ¶ FRANK F. TRIPP '87, date unknown.
- ¶ FRANK H. ADAMS '88, December 26.*
- ¶ FRANK M. JAMES '88, March 29.*
- ¶ FRANK B. MEADE '88, March 22.*
- ¶ SAM WHEELER '88, April 13.
- ¶ FREDERICK L. HOPKINS '89, March 4.*
- ¶ FRED W. RANNO '89, July 23, 1946.*
- ¶ WILLIAM L. SMITH '89, February 21.*
- ¶ ADOLPH HALLENBERG '90, February 13.
- ¶ HENRY B. PENNELL '90, June 18.
- ¶ RALPH D. COLBURN '91, March 12.*
- ¶ HARRY E. CORMIER '91, March 2.*
- ¶ MORRILL S. RYDER '91, June 17.
- ¶ GEORGE A. MERRILL '92, April 22.
- ¶ HAVEN DOE '93, in October.
- ¶ CHARLES E. GARSTANG '93, May 22.
- ¶ ST. JOHN A. LAWTON '93, February 14.
- ¶ FREDERICK D. SMITH '93, April 20.
- ¶ EMMA KRAMER GREENLAW '94, May 2.
- ¶ LEWIS S. GREENLEAF '94, April 27.
- ¶ FRANK S. HOWLAND '94, February 20.
- ¶ ALBERT F. HUNT, JR., '94, April 18.
- ¶ FRANK M. SOUTHARD '94, April 1.
- ¶ HERBERT E. DAVIS '95, May 22.
- ¶ FRED W. DRAPER '95, January 30.*
- ¶ JOSEPH C. WALIER '95, December 8.*
- ¶ ARTHUR W. HODGES '96, January 16.*
- ¶ ANNIE G. MOLLOY '96, October 7, 1945.
- ¶ LUCY D. THOMSON '96, in 1940.*
- ¶ WARREN D. BROWN '97, April 21.*
- ¶ WILLIAM C. EWING '97, May 9.
- ¶ HORACE MANNING '97, November 12.*

- ¶ CHARLES B. PAINE '97, July 10, 1945.
- ¶ GEORGE F. DOTY '98, February 3.
- ¶ CHARLES S. DRAKE '99, March 19.*
- ¶ ROBERT FRAZER '99, April 6.*
- ¶ FREDERICK R. SITES '99, April 29.*
- ¶ JAMES H. WALTON '99, June 6.
- ¶ RICHARD C. DEWOLF '00, March 8.
- ¶ EDWIN W. HAMMOND '00, January 29.
- ¶ LEWIS M. LAWRENCE '00, September 7, 1945.
- ¶ BRACKLEY A. SHAW '00, December 22.
- ¶ EMIL F. VOGEL '00, April 8.
- ¶ JOSEPH A. GARVIN '01, January 4.*
- ¶ LEROY E. KERN '02, March 12.
- ¶ HERBERT M. BACON '03, March 19.*
- ¶ MELLEN C. M. HATCH '03, April 5.*
- ¶ ERNEST W. CALKINS, JR., '04, March 30.
- ¶ VICTOR H. ELSAS '04, April 17.
- ¶ GRANT FORD '04, April 29.
- ¶ WILLIAM MCENTEE '04, September 7, 1946.
- ¶ GEORGE C. RICHARDS '04, May 2.
- ¶ WILLIAM H. HUMPHREY '05, July 29, 1945.
- ¶ CLARENCE M. COCKRELL '06, October 10.
- ¶ RALPH W. RENTON '07, September 1.
- ¶ ARMEN H. TASHJIAN '07, April 3.*
- ¶ EDWIN C. BALL '08, May 29.
- ¶ ALTON M. COOK '08, March 28.*
- ¶ JESSE K. FLANDERS '08, February 28, 1946.*
- ¶ ROBERT ROBERTSON '08, April 16.
- ¶ RICHARD S. AYRES '09, October 22.*
- ¶ HAROLD GARDNER '09, January 22.*
- ¶ MARTIN W. LAUTZ '09, in 1945.
- ¶ CLARK S. ROBINSON '09, May 23.
- ¶ MAURICE S. CHAPIN '10, May 11.*
- ¶ RALPH E. SAWYER '11, May 18.*
- ¶ HARRY W. WATERFALL '11, March 26.*
- ¶ VOLANT V. BALLARD '12, October 24.
- ¶ GRAHAM HARRIS '13, September 3.
- ¶ WALDO B. MILLER '13, August 26.
- ¶ RENE A. RICHARD '13, April 18.*
- ¶ CHARLES SHAW '14, January 30.
- ¶ DONALD W. PERIN '15, June 19.
- ¶ VICTOR L. S. HAFNER '18, April 26.*
- ¶ JOHN G. MCLEOD, JR., '20, August 6.
- ¶ RAYMOND R. RIDGWAY '20, June 15.
- ¶ ERNEST G. GILES '22, December 9.
- ¶ GEORGE W. POTTER '22, June 16.
- ¶ THOMAS W. CONRAD '23, February 14.
- ¶ HARRY GOODMAN '24, April 24.*
- ¶ JOHN R. MCPHEE '24, April 15.
- ¶ AUGUSTO S. BRUNA '25, August 5.
- ¶ ELLSWORTH S. GRAY '25, April 5.*
- ¶ C. FRANCIS JENKINS, JR., '26, June 18.
- ¶ ALBERT E. MULLIKEN '31, March 2.*
- ¶ WALTER A. ISLER '39, March 5.
- ¶ EDWARD J. LEMANSKI '41, February 23.
- ¶ ROBERT J. McDERMOTT '45, February 10.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

New England Conference on Graduate Education

The fourth meeting of the New England Conference on Graduate Education was held at Smith College on May 2 and 3. Fifty-six representatives of 28 colleges and universities participated. The M.I.T. representatives were Dean Bunker, as president of the conference, Professor E. H. Huntress '20, as chairman of the program committee, and Vincent L. McKusick '47, VI-A, who engaged in a graduate student panel discussion, "The Graduate Student Looks at the Graduate School." Other participants in this "public conversation" were from Harvard, Yale, Boston University, Radcliffe, and Smith. For an hour deans and professors listened and squirmed and at its conclusion broke into a storm of applause. The students were entirely frank and showed a keen perception of such matters as the diversion of professorial attention from teaching under the compulsion of getting out publications in order to maintain their places in the academic world; the use of graduate students as cheaply bought substitutes for handling classes; the affront to the intelligent graduate student of being spoon-fed without adequate opportunity for self-education; the narrowing effect of regulations which inhibit the attainment of breadth under the stress of requirements for specialized depth; the encouragement to pass courses as distinguished from the attainment of scholarship. In the ensuing question-and-answer period the panel more than held its own.

Ceramic Society Dinner

The annual convention of the American Ceramic Society, held at Atlantic City from April 21 to 24, included a dinner for Technology Alumni, which was attended by the following: Karl E. Peiler '04, Henry K. Richardson '04, Horace E. Allen '08, Robert A. Miller '16, Frederick H. Norton '18, Garnett H. Porter '18, Henry H. Blau '20, Flemmon P. Hall '21, Arthur A. Turner '21, Jack H. Waggoner '21, J. Earl Frazier '24 and Mrs. Frazier, Maxon H. King '25 and Mrs. King, Charles L. Norton, Jr., '25 and Mrs. Norton, Victor J. Duplin, Jr., '31, Bradford Hooper '34 and Mrs. Hooper, Sidney Speil '36, Milton S. Tarnopol '36, James W. Vanderpool '36, Harry Whittaker '40, and Ahmad Nawaz '46.

M.I.T. Club of Albany

The Club held its regular dinner meeting at the Wellington Hotel on May 8. A new set of bylaws was presented by a regularly appointed committee and unanimously adopted as presented. It is felt that under the new bylaws we shall be better able to carry out a more active program with in-

creasing interest on the part of the Alumni in this area. The following officers were elected for the new fiscal year: George C. Myrick '25, President; F. Reed Dallye '22, Vice-president; Harold F. Hedberg '20, John G. Fairfield '16, and John F. Longley '33, members of the newly authorized board of governors for terms of three, two, and one year respectively. Our special guest and speaker for the evening was Victor Holland, assistant commissioner in the New York state department of labor. Mr. Holland outlined the services of the department to both employer and employee, speaking particularly of its safety work, inspections, and education program, and emphasizing the fact that policing was a minor portion of their work. Education is more and more taking the place of policing. — GEORGE W. SCHAIBLE '30, *Secretary*, New York Telephone Company, 158 State Street, Albany, N. Y.

M.I.T. Club of Central Pennsylvania

The spring dinner meeting of the Club was held on April 28 at the Penn Harris Hotel in Harrisburg. After dinner our President, Frank A. Robbins '02, who was recently appointed secretary of public assistance for the Commonwealth of Pennsylvania, called the meeting to order. Percy E. Tillson '06, Honorary Secretary in this area, commented briefly on his activities as contact man for prospective students. He pointed out that an applicant has about one chance in 10 of being accepted. C. J. Walton '14, chairman of the nominating committee, made his report, which was unanimously accepted. The officers for the ensuing term are F. A. Robbins '02, President; G. C. Wilson '15, Vice-president; H. R. Spaans '30, Secretary-Treasurer.

After this short business meeting, President Robbins introduced our guest speaker, Charles S. Dewey, Jr. Mr. Dewey talked of his experiences as a member of the Office of Strategic Services. For the benefit of those who were not in service during the war, he explained that the O.S.S. was formed in order to "get things done in a hurry with a minimum of red tape — things primarily concerned with intelligence." He stated that, because of the nature of their work, they were sometimes known as the cloak and dagger boys. After a training period in this country, Mr. Dewey was transferred to the China theater. There he was stationed, for approximately eight months, behind the Japanese lines, working with the Chinese guerrilla forces. For about one-half of this time he did demolition work to help these forces withdraw. In the second period Mr. Dewey reconnoitered and photographed the coastline near Canton. The speaker commented on the necessity of living carefully while on such a mission. Since the O.S.S. teams were very small, no member could afford to be ill. Health precautions were a daily,

minute-by-minute necessity. Mr. Dewey believes that China is in dire need of modern communications and transportation. Until this vast country is more closely knit, poverty and starvation prohibit the normal growth of patriotism.

The following club members were present: E. A. Weimer '98, F. A. Robbins, Jr., '02, P. E. Tillson '06, R. E. Irwin '09, C. J. Walton '14, G. C. Wilson '15, F. E. Thomas '17, F. H. Wells '18, J. R. Elliott, Jr., '23, B. J. Stevens '23, T. P. Kuo '24, H. K. Gold '28, S. G. L'Esperance '30, H. R. Spaans '30, A. S. Avakian '33, C. E. Fink '33, R. K. James '33, Harold Radcliffe '41, R. E. Smith '41, H. W. Welch '47. In addition, Mr. Van Riper, a Dartmouth alumnus, was the guest of Mr. Tillson. — HAROLD R. SPAANS '30, *Secretary*, Bell Telephone Company of Pennsylvania, 210 Pine Street, Harrisburg, Pa.

M.I.T. Club of South Texas

President Compton of Technology delivered the principal address at the recent inauguration ceremony held here on the occasion of William Vermillion Houston's officially becoming the new president of the William Marsh Rice Institute. The audience of five or six hundred included many noted educators from various states and from abroad, as well as a large number of persons of social, professional, and business leadership and prominence in the community. Harry C. Wiess, special term member of the Corporation, and Joseph A. Tennant '13, President of this Club, took active parts in the ceremony of inauguration on April 10.

No report has been received by us that any of the 10 or 12 Alumni living in Texas City were injured in the explosions which occurred there last April. Joseph R. Mares '24, general manager of the Monsanto Chemical Company works at Texas City, has stated that the entire plant will be rebuilt. Work is proceeding on this now and may be completed, he thinks, in about 18 months.

A copy of "Technology," the 1946 directory and yearbook of the M.I.T. Club of Chicago, has been received. This excellent and interesting publication is available on a loan basis to Alumni of this section and will be sent by mail on request. — JOSEPH H. McEVOR '21, *Secretary*, 202 McGowen Avenue, Houston 6, Texas.

Indiana Association of the M.I.T.

The last meeting of the 1946-1947 season was held on May 21 in the Ward Room of the beautiful Naval Armory on 30th Street at White River. A delicious steak dinner with all the fixings was served.

After the meal a short business meeting was held. It was voted to hold the meetings next season on the second Thursday of the month, with the exception of the one in October which is to be held on Tuesday the 28th.

President Peabody '21 then introduced Don Brewer, engineer with Esterline-Angus Company, who described and showed pictures and diagrams of the airborne magnetometer. This device proved its value during World War II in ferreting out wolf packs of German submarines as much as 300 feet below the surface of the ocean, a job similar to locating the needle in the familiar haystack. Submarine skippers were seldom aware of it. It was referred to as M.A.D. (Magnetic Airborne Detector) by the Navy. The instrument assembly was usually carried by a TBF torpedo bomber within a birdlike container trailed behind the plane and reeled in during take-offs and landings. This device gained much credit for winning the Battle of the Atlantic and contributing to the success of operations at Casablanca. Nearly 200 Nazi submarines lurked near or around Gibraltar, but M.A.D. so effectively neutralized them that our total casualties were held to 23 craft sunk. A recent statement by Admiral Ingram, Commander-in-Chief of the Atlantic Fleet, was to the effect that, had the rate of Allied shipping losses in early 1942 continued, there would have been no Africa, Mediterranean, or Normandy invasions.

The operation of this detecting device depends upon the magnetic field of the earth. This field is changed in direction and strength by the presence of various "anomalies," as they're termed by the geophysicist. The magnetic field of the earth is developed by large deposits of magnetic materials deep within it, which collectively may be likened to a huge and powerful bar magnet of length equal to about one-tenth of the earth's diameter. The lines of force from this magnet emerge near the magnetic poles and encircle the globe. At the poles the intensities of this magnetic field are about three times as great as near the equator. Lines of force are neither smooth nor unchanging, mainly because of the earth's position and of sun spots. Along the earth's surface these lines of force are further distorted by certain minerals, such as magnetite and ilmenite, which appear in ore deposits. Also responsible for distortion are irregularities in the earth's crust, resulting in concentrations in these force lines. These are the anomalies looked for by the geophysicist when hunting for oil or ore; faults in rock formation under which oil may be found distort the magnetic field. So does the submarine, because of its metallic construction, likewise bridges, railroads, and other ferrous metal structures. But subs cause less distortion, and as the effect above the earth varies inversely as the cube of the elevation, the plane has to fly low, at about 500 feet, to detect the underwater craft. For geophysical survey, the plane flies much higher, where natural faults are still measurable but where man-made structures have little effect; such altitudes range from 1,000 to 10,000 feet.

Actual detection is accomplished by a "fluxgate" element, a spool of wire on an iron core carried on a gimbals in the birdlike container. Electronic circuits keep it aligned with the earth's field to avoid errors in measurement. Signals are transmitted to the equipment in the plane, which builds up the current recorded on an Esterline-Angus instrument. The position

of the recording needle represents a certain field strength above a preset datum value. Recordings of the vertical and horizontal positions of the plane co-ordinated with photographic records, later obtained from a 35-millimeter Sonne strip camera, are necessary in correlating information for geophysical work. Over large bodies of water radar is used to establish position. The per-mile cost is far cheaper than present methods. About 25 square miles can be surveyed in an hour.

Mr. Brewer graciously answered the many questions evoked by interest in his talk.

The following members were present: J. Lloyd Wayne '96, John B. Welch '13, John H. Babbitt '17, Elliott G. Peabody '21, Lowell L. Holmes '23, Harry C. Karcher '25, Stanley C. Boyle '27, Thomas G. Harvey '28, Russell Fanning '30, Samuel H. Hopper '33, and James J. Monagle '35. — JOHN H. BABBITT '17, *Secretary*, 3734 Carrollton Avenue, Indianapolis 5, Ind.

M.I.T. Club of New Hampshire

On May 14, the Club was honored by having President Compton of the Institute as guest speaker at the dinner meeting held at the Manchester Country Club. Robert C. Erb of Nashua, our President, presided over the gathering of 72 members and guests. The Club was pleased to welcome Robert M. Kimball '33, assistant to Dr. Compton, Ralph T. Jope '28, and Samuel C. Prescott '94, as well as Henry E. Worcester '97, who came up from the Institute. The members were unanimous in their feeling of regret that Charles Locke '96, who has been with us so many times, was unable to be present on account of illness; they voted to have the Secretary write a letter to Professor Locke.

Robert Erb '17 brought his son, as well as Raymond Fitch, a student at the Manchester high school, who hopes to attend Technology. C. R. Myer, Jr., '22 brought his son, who will enter M.I.T. in the fall. A delicious steak dinner was enjoyed by the members and guests. President Erb then called on each member to give his name, class, residence, and business. At the business meeting it was voted, in accordance with a request from the Alumni Association, to change the name of the Club to the M.I.T. Club of New Hampshire. Carl Hall '08, as chairman of the nominating committee, brought in the following nominations: President, Malcolm C. Mackenzie '14; Vice-president, Harold Langley '19; Vice-president, Arthur Roberts '04; and Secretary-Treasurer, Blaylock Atherton '24. Carl told the assembly that none of these brethren except the Secretary had been consulted concerning their willingness to serve, but it took only a short sales talk to convince the nominees that they should accept their nominations. There being no other nominations, the Acting Secretary cast one ballot for those recommended by the nominating committee, and President Erb declared them duly elected.

Ralph Jope gave an interesting talk on the athletic program at the Institute, stating that we now have 15 sports which are well attended and include practically all college sports with the exception of football and baseball. Dr. Prescott talked on

some of the meetings of our Club held in the old days and reminisced on the good times we had as guests of our former President, Dad Rollins '71, at Three Rivers Farm in Dover. The Hall brothers had some pictures of those early meetings, which were viewed with interest and a feeling of nostalgia by some of the older members.

Dr. and Mrs. Compton were welcomed enthusiastically by the members and guests. Dr. Compton divided his very interesting address into two parts. He first spoke on the revival of M.I.T. clubs all over the world, saying that he had attended a meeting of the M.I.T. Club of Manila shortly after V-J Day and describing the occupations of various Alumni in the islands. One Alumnus who had lost his fortune in the war was making a comeback by manufacturing synthetic gin and using the profits from this business to purchase machinery in the United States so that he could manufacture various items which would be used in the rehabilitation of the Philippines. President Compton also told of meetings of the M.I.T. clubs of Honolulu and Chicago. He then went on to tell us that the Institute was embarking on a new program of athletics under the leadership of an athletic director, who would be a salaried executive and would take over the duties of the old Athletic Council. [More details may be found under the President's Alumni Day address on page 537. — Ed.]

During the second part of his discourse, Dr. Compton traced the growth of the use of uranium, which 44 years ago was used only for the extraction of radium, and gave us the story of the development of its use up to the present time. He stated that if we assumed only a 10-per-cent conversion of heat to mechanical or electrical energy, two tons of uranium would be sufficient to operate the Detroit-Edison Company for one year; and that a piece of uranium as big as the water pitcher in front of him would supply enough energy to provide electricity for the city of Honolulu for one year. He said that there were many problems that would have to be worked out before such conversion would be possible and predicted that atom power plants would not give serious competition to those operated by coal or oil unless the prices of coal or oil should substantially advance. A possible exception to this would be atomic energy plants which could be used on ships or in Antarctica or Greenland. He stated that it would be necessary to encase such a plant in at least 50 tons of concrete so that workers using it would not be killed, and that for this reason it would seem that atomic energy would never be used for running automobiles.

He told us that M.I.T. now has a program of nuclear energy and that Navy research on the subject is going on. Dr. Compton concluded his discourse with a résumé of the financial situation at Technology, stating that with 5,250 students the Institute is now operating on a \$13,000,000 budget, and gave us some excerpts from the new brochure entitled "M.I.T., A New Era" which is to be sent out to Alumni and other friends of the Institute. After Dr. Compton's address, our new president, Mac Mackenzie took over the meeting, which shortly adjourned. — BLAYLOCK ATHERTON '24, *Secretary*, 142 Main Street, Nashua, N. H.

M.I.T. Club of Milwaukee

Our first full season of meetings in five years will come to an end on June 27 with an informal supper dance at the Milwaukee Beach Club.

A dinner meeting was held at Miller's Inn on April 4. Jack Wilson, a physicist for the Allis-Chalmers Manufacturing Company, spoke on the "Development of Electronuclear Machines in Science and Industry." Although there were no nuclear physicists in the audience, the speech and dinner were thoroughly enjoyed by the 23 members attending, namely: John B. Ballard '35, Michael F. Biancardi '40, Warren A. Bjorn '34, Frank E. Briber, Jr., '43, Maurice T. Crowell '24, John F. H. Douglas '05, Frank E. Hamilton '07, Leon J. D. Healy '09, A. Preston Heintz '38, James K. Heller '45, Curt E. Hoerig '38, Bjorn Lund '41, William Mark '43, Johann H. Meier '38, Chester E. Meyer '36, Leo B. Miller '15, Merrill R. Moore '45, William H. Roddis '41, David G. Smith '31, Edwin L. Smith '05, Robert R. Solverson '45, Emerson van Patten '24, and Bruno Werra '32.

We are looking forward to a very active and successful season next fall. Milwaukee is a busy industrial center with a wide variety of industries and as such should attract many engineers. For the sake of this Club and of Milwaukee itself, we hope that M.I.T. will continue to be well represented here. — WILLIAM HAHN '42, *Secretary*, 750 North 14th Street, Milwaukee 3, Wis.

M.I.T. Club of the Province of Quebec

The annual dinner meeting of the Club was held on May 12 at the Windsor Hotel in Montreal. The guest of honor and speaker of the evening was Dr. Compton, whose talk covered two main topics, namely, atomic energy and the affairs of the Institute. After a brief outline of the history of nuclear physics, President Compton described the efforts made in various countries, before and during World War II, toward the harnessing of atomic power and also gave a preview of what an atomic power plant might look like and at what cost it could produce energy. Dr. Compton was introduced by Paul Kellogg '11, President of the Club, and thanked by Dr. Frigon '11, President of the Ecole Polytechnique, which is the school of engineering of the University of Montreal.

Before President Compton's talk, the affairs of the Club had been disposed of in a prompt fashion, resulting in the election of the following executive committee for the next year: President, Paul Kellogg '11 (re-elected); Vice-president, Henri Gaudet '34 (re-elected); Secretary-Treasurer, Jacques Laurence '40; councillors, term expiring in 1950, René Simard '28, and F. David Mathias '36; term expiring in 1949, Harold C. Pearson '23, and François P. Rousseau '27; term expiring in 1948, Huet Massue '15, and A. T. Eric Smith '21.

Dr. Compton was accompanied by Mrs. Compton and their son, Arthur. The attendance totaled 78 persons and included the following club members, most of them with their wives: 1898: L. J. Seidensticker; 1900: W. S. Hart; 1902: Humphreys Milliken; 1907: E. C. Richardson; 1908: H. S.

Chandler; 1909: M. H. McCrady; 1910: C. A. Robb; 1911: Augustin Frigon, Paul Kellogg, W. J. Peard, Jr.; 1915: Huet Massue; 1916: Aimé Cousineau; 1921: P. F. Beaudry, Maurice Gérin, A. T. Eric Smith; 1922: A. D. Ross; 1923: M. L. Carey, H. C. Pearson; 1925: G. E. Rousseau; 1926: R. D. Packard; 1927: F. P. Rousseau; 1928: René Simard; 1929: G. L. White; 1930: René Laplante; 1931: L. A. Fraikin, W. M. Keddie; 1933: S. J. Hungerford; 1934: C. P. Beaubien, Henri Gaudet, H. N. Karr, J. M. Raymond; 1935: N. H. Bell; 1936: F. D. Mathias, J. J. Rowan; 1940: J. R. Laurence; 1941: J. E. M. F. Lecavalier; 1942: F. J. di Salvo, H. H. Schwartz; 1943: W. B. Terry, Jr.; 1945: H. A. Audet, F. G. Leroux; 1946: Q. R. Ball, R. W. Kobb, P. J. Pocock, Jr., P. H. Wong. Also present were: J. S. Keenan '23 (former President of the M.I.T. Club of Lower Ontario), I. Brouillet, E. C. Common, V. J. Rahilly. — JACQUES R. LAURENCE '40, *Secretary*, 1430 St. Denis Street, Montreal 18, Canada.

New Haven County M.I.T. Club

The meeting of March 26 was held at the University Club, Hotel Elton, Waterbury, Conn. Cocktails were served from six-thirty to seven o'clock and followed by an excellent turkey dinner. The formal meeting was opened at 9:00 p.m. by President Grew '27. The minutes of the previous meeting were read and approved as read. President Grew announced that Roy Parsell '14 will not be general chairman of the Pine Orchard outing and that Mort Plant '31 will take over the job. The President then thanked J. L. Hetzel '23 and F. G. Purinton '15 for the excellent arrangements made for the meeting and presented Dr. Hetzel. Dr. Hetzel introduced Oscar Warner, the speaker of the evening, who showed colored motion pictures of his trout and salmon fishing and skiing trips and also color films of his garden in Woodbury. The excellent color movies and the interesting comments by Mr. Warner brought out a flood of questions, proving the enjoyment of all those present. A social program followed, with dancing, cards, and just plain "bull" until late in the evening. President Grew announced his selections for the nominating committee to prepare a slate and ballots to be issued to members so that the new officers may assume control at our annual meeting in June. The nominating committee selected consists of Nettleton, Healey, and Jacobson.

About 15 wives and guests were present with the following Alumni: F. G. Purinton '15, M. S. Wellington '16, S. MacL. Boyd '18, H. A. Alter '21, J. L. Hetzel '23, L. B. Grew '27, F. W. Buck '29, F. P. Nettleton '30, R. K. Roulston '34, W. P. Canning '36, J. W. Aldrich '37, C. F. Healey '37, W. S. Wojtczak '37, J. M. Rogers '40, G. O. Schneller '40, R. C. Maconi '44, R. L. Sundblad '45, and S. G. McIntyre '46. — WALTER S. WOJTCZAK '37, *Secretary*, Dwight Building Company, 152 Temple Street, New Haven, Conn.

Technology Club of New York

Since our last message to the Alumni, much has happened of interest to many of us. Volume 17, No. 1, of "M.I.T. in New

York" made its appearance, being circulated to the entire list of Alumni in the Greater New York area. For those New York Alumni who are not residing in the area, a few repetitions may be in order.

New officers of the Club were elected at the May meeting. Ray Rundlett '22 was elected president for the ensuing year. Ray is a very community-conscious citizen and during the last few years has held numerous responsible offices in the city of Bronxville, N.Y. Vice-presidents elected were E. S. Burdell '20, J. H. Zimmerman '23, W. H. Mueser '22, and Sam Reynolds '22. W. J. Littlefield '17 and A. L. Bruneau, Jr., '38 were elected treasurer and assistant treasurer respectively. Joe Littlefield succeeds W. I. McNeill '17, who has served most faithfully as club treasurer for the past two years. The undersigned was again elected secretary of the Club for at least another year. New members of the board of governors, serving until 1950, were D. H. McNeal '23, Andy Mooradian '34, and W. L. Keplinger, Jr., '24. James R. Killian, Jr., '26, Vice-president of the Institute, was guest speaker at the annual election meeting and was greeted by many Alumni.

As soon as the necessary papers can be drawn up by Dave Brophy '16, we will change our name to the M.I.T. Club of New York. Complete details regarding membership requirements will be released, as soon as final arrangements are completed. I think it will be a much more identifying name for the Club than that which we have had for the last few years. If you doubt it, refer to a Manhattan telephone directory and see how many technologies of various and sundry kinds are listed therein; and there are many more not even listed.

Again let me remind you of activities planned for the rest of this year: the annual golf outing at the Scarsdale Golf Club on June 20; the early fall outing at Mount Kisco Country Club on August 26; the brand new steak-stein dinner, being held this year at the Jacob Ruppert Brewery on September 18; the fall smoker, held at club headquarters on October 15; the Dick Ranger bridge tournament, being held in October and November, details to be released later; and the annual Compton Dinner at the Hotel Biltmore on December 9. By that time, the new activities committee will be under way with many new programs for your entertainment.

Since our last message, we learn with regret of the passing of three prominent Alumni who lived around New York: William L. Hallett '77 of 49 East 19th Street, Brooklyn, on March 30; Frank L. Connable '93 of 1 East 42d Street on March 14; and Arthur H. Hastings '08 of 258 Riverside Drive, in July, 1944.

There will be no more reports until fall. We hope to see many of you at the All-Technology Reunion, in Cambridge on Saturday, June 14. Class fund drives and class activities seem to be pushing ahead in great shape. We are still at the same old stand. — WILLIAM W. QUARLES '24, *Secretary*, McGraw-Hill Publishing Company, 330 West 42d Street, New York 18, N.Y.

M.I.T. Club of Philadelphia

The Golden Anniversary meeting of the Club was held in Wilmington, Del., on May 20. In order properly to observe this

momentous occasion, the officers of the Club had tendered invitations to all members of the classes of '97 or before to attend as honored guests. Four men were able to avail themselves of the opportunity and told us something of the early days of the Club and of M.I.T. Their names are listed below, along with the other members who attended the dinner. After a few pertinent remarks by our President, George T. Logan '29, the speaker of the evening, was introduced by Lammot du Pont '01. The speaker was none other than President Compton of M.I.T., who first entertained us with some good stories he had picked up during the past few weeks. He then told us something of the wartime accomplishments of our school, of the general trends in education throughout the country, and of the plans and needs of the Institute. More than 65 per cent of the Club's membership and 24 guests brought the total attendance to 184 persons, who first congregated in the DuBarry Room of the Hotel du Pont for a tasty punch before being seated at a delicious meal.

The men who attended, arranged by class, are listed below: 1895: S. S. Sadtler; 1896: D. M. Bates; 1897: Wilfred Bancroft, Irénée du Pont; 1900: N. D. Rand; 1901: Lammot du Pont; 1902: C. B. Annett; 1903: W. P. Regestein; 1905: Claude Anderson, F. J. Chesterman, W. F. Harrington; 1907: F. S. MacGregor, H. W. Mahr; 1908: James McGowan, Jr.; 1909: T. C. Merriman; 1910: P. W. Burnham; 1912: C. A. Cary, J. E. Whittlesey; 1913: R. W. Weeks; 1914: Roger Williams; 1915: H. W. Anderson, K. T. King, E. A. Whiting; 1916: Mark Aronson, O. B. Pyle, Jr.; 1917: W. H. McAdams, W. J. Beadle, A. C. Carlton, Garland Fulton, O. W. Holt; 1918: E. R. Bridgewater, F. S. Cross, D. M. McFarland, C. A. Lindgren, Jr.; 1919: H. F. Marshall; 1921: S. J. Hill, T. A. McArn, C. E. Mendinhall; 1922: A. T. Barclay, C. T. Chu, Albert Kruse, H. S. Dimmick, Joseph Greenblatt, H. Felton Metcalf, D. N. Shaw, C. W. Stose; 1923: P. J. Culhane, F. T. Entwistle, E. T. Healy, R. L. Hershey, H. P. Kelley, F. E. Klutey, E. D. Ries, R. G. Rincliffe; 1924: H. C. Bailey, E. W. Bruggmann, W. L. Morgan, M. A. Perkins, E. A. Taylor; 1925: H. D. Bevan, R. E. Cernea, C. M. Cooper, C. L. Petze, Jr., C. B. Weiler, R. N. Wheelock; 1926: M. J. Bergen, J. O. Crawford, J. Q. du Pont, Howard Humphrey, H. W. Jones, K. S. Lord, M. S. Smith, W. E. Vaughan, F. E. Washburn; 1927: J. S. Bancroft, A. G. Connolly, L. R. MacAdam, H. E. Muhlenberg; 1928: C. E. Berry, R. M. Harbeck, J. W. Hill, O. W. Rideout, F. D. Sparre, C. H. Topping; 1929: D. T. Foley, G. T. Logan, V. G. Miskjian, H. C. Vernon, L. J. White; 1930: G. E. Barker, J. W. Patton, W. H. Wannamaker, Jr.; 1931: W. C. Kay; 1932: F. S. Chaplin, T. J. Jones, M. T. Meyer, C. M. Thayer, L. T. Tyburski; 1933: R. M. Armstrong, J. E. Carbonell, Jr., W. W. Laird, Jr., A. J. Sysko; 1934: W. W. Cogdill, J. A. Drankowski, L. P. Holladay, 3d; 1935: W. H. Brockett, E. K. Dockstadter, J. W. Libby, Jr.; 1936: A. A. Carota, R. R. Hitchcock, J. A. Myers, W. V. Osgood, L. M. Smith; 1937: E. K. Gladding, F. D. Houghton; 1938: Jeanne Kitenplon Gladding, L. W. Hull, F. R. Klauck, C. W. Maynard, Jr., F. E. Ray; 1939: N. E. Carr,

Jr., W. F. Corl, Jr., J. J. Donovan, G. McG. Richardson, E. B. Snyder; 1940: E. C. Avery, D. W. Crawford, J. K. Knight; 1941: O. A. Bredeson, W. R. Burke, D. K. Duffey, 3d, C. W. Hargens, S. K. McCauley, O. H. Paddison, Jr., C. W. Streed, J. S. Thornton; 1942: H. G. Clarke, Jr., D. B. Mitchell, E. W. Smith, Jr., F. M. Staszkesky; 1943: P. D. Goggin, S. P. Higgins, Jr., E. R. Kane, W. G. Loudon, R. N. Lovett; 1944: Claude Corty, V. S. Ezykowski, G. V. Land, F. H. Sanders, P. W. Wilder, Jr.; 1945: G. K. Landon, Jr.; 1946: C. J. Fisher, W. L. Milliken, W. H. Peirce, F. B. Wilder; 1947: Edmund Engle, P. A. Knudsen. — ROBERT M. HARBECK '28, *Secretary*, 605 Foss Avenue, Drexel Hill, Pa. *Assistant Secretaries*: SAMUEL K. MCCAULEY '41, 288 Copley Road, Upper Darby, Pa.; WILEY F. CORL, JR., '39, Box 532, Bryn Mawr, Pa.

M.I.T. Club of Western Pennsylvania

The fourth formal meeting of the 1946-1947 season was held at the University Club in Pittsburgh at 6:30 P.M. on April 29. It was attended by 47 members and one guest. After an informal period, concluded by an excellent buffet supper, President R. G. Lafean '19 opened the business meeting. Reports were made by the Treasurer, E. M. Barnes '23, and the Secretary, W. J. Bates '35. President Lafean reported that the board of directors had met before the regular meeting and appointed P. R. Toolin '39 to fill the vacancy on the board caused by the resignation of S. C. Johnson '39, who has moved to Worcester, Mass. He also announced the appointment of a nominating committee consisting of F. W. Waterman, Jr., '25, chairman, C. M. Boardman '25, R. D. Hoak '28, E. M. Barnes '23, and H. H. Hall '14. After the business meeting, the group enjoyed a series of pictures presented by the United States Steel Corporation, dealing with the production and use of steel. R. E. Zimmerman '11 conducted a question-and-answer period.

The following members were present: C. T. Barker '27, E. M. Barnes '23, W. J. Bates '35, W. U. C. Baton '04, W. K. Bodger '40, H. L. Bone '17, E. L. Chappell '24, T. T. Crowley '42, T. J. Donnelly '46, J. A. Drain '26, F. J. Fleischauer '42, G. M. Frank '23, D. S. Fraser '28, M. M. Greer '26, H. H. Hall '14, R. D. Hoak '28, G. M. Hoffman '28, L. M. Huggins '12, B. M. Hutchins '32, Mary C. Jansen '46, R. G. Lafean '19, H. L. Lang '09, J. W. Logan, Jr., '20, H. W. McIntosh '19, I. E. Madsen '33, Raymond Mancha '26, A. T. Mason '33, E. H. Millard '03, G. C. Morrisette '35, Almer H. Orr, Jr., '32, E. K. Owen '41, B. M. Putch '28, G. N. Reed '23, J. F. Robinson '22, P. M. Robinson, Jr., '44, P. W. Robinson '26, M. W. Saxman '47, R. H. Shriver '29, W. M. Siebert '46, J. L. Thistle '32, P. R. Toolin '39, J. L. Wandrisco '46, F. W. Waterman, Jr., '25, and R. E. Zimmerman '11.

On May 9 two hundred members and guests of the Club celebrated "M.I.T. Night" at the Pittsburgh Playhouse, where they enjoyed the musical show "After Hours." On May 12, a luncheon at the Fort Pitt Hotel to greet T. P. Pitre, Dean of Freshmen, and H. E. Lobdell '17, Executive

Vice-president of the Alumni Association, assembled the following members: A. J. Abrams '24, E. M. Barnes '23, W. J. Bates '35, C. M. Boardman '25, T. W. Bossert '20, D. S. Fraser '28, H. H. Hall '14, B. M. Hutchins '32, R. G. Lafean '19, R. A. Miller '16, G. C. Morrisette '35, R. C. Rankin '23, J. L. Thistle '32, and M. L. Tressel '24. — WILLIAM J. BATES '35, *Secretary*, 141 Woodhaven Drive, Pittsburgh 16, Pa.

M.I.T. Club of the Connecticut Valley

The annual meeting of the Club was held on May 28 at Tinti's Restaurant in North Agawam. The speaker was Fred W. Sehl, a chemical engineer trained at Pratt Institute, assisted by George Whelpley, a Northwestern University graduate. Both men are employed by the Aetna Casualty and Surety Company as insurance engineers. For about an hour, they demonstrated dust explosion and flash fires, with an extensive set of equipment.

Since the March meeting of the Club, 10 new members have been added to the Springfield mailing list, and the Secretary wishes to ask all resident Alumni to make welcome the following men: Walter T. Biggar '18 of 46 Wayside Street, Springfield; Harland P. Sisk '27 of 71 George Street, Holyoke; Theodore H. Morehead '34 of 37 Old Ace Road, Springfield; Dana C. Chase of Colony Road, Longmeadow; David G. Kobick '47 of A. G. Spalding and Brothers, Chicopee; the Rev. Donald N. Alexander '98, Christ Church Cathedral, Springfield; Maurice E. Bates '35, 86 Cows Road, North Amherst, Stanley M. Bebler '34, 51 Dresden Street, Springfield; and Irving S. Fagerson '42, 14 Allen Street, Amherst. Three members of the Club, Robert McC. Marr '44, Ernest A. Gamache '46, and Laurence A. Stone '35, have moved away from Springfield.

At an executive committee meeting on April 16 held at the home of Donald Ross '27, President of the Club, in Longmeadow, a nominating committee, consisting of Elbert Lovenberg '16, H. Roy Harris '24, and Alfred G. Payne '33, was appointed to serve for the rest of the present year and to present nominations for officers at the May annual meeting and election.

As previously reported in the May issue, the Club had a very successful dinner meeting on March 19 at the Town Hall Grill, with Professor Wiel of Springfield College as the guest speaker. The following members attended the meeting: H. D. Addison '31, J. A. Berges '40, B. G. Constantine '26, R. E. Curtis '15, M. R. Edwards '22, W. A. Emery '21, T. W. Hafer '35, S. J. Hayes '19, David Hobkirk '47, H. D. Johnston '27, John Kapinos '40, T. O. J. Kresser '34, T. F. Lange '01, A. M. Lovenberg '16, G. E. Murray '32, M. H. Nickerson '37, F. A. Nicoli '34, L. J. Powers '23, I. H. Small '28, C. R. Stempf '42, G. H. Temple '36, J. L. Van Horn '34, and P. G. Volanakis '42. — MINOR R. EDWARDS '22, *Secretary*, Holyoke Heater Corporation, 54 Waltham Avenue, Springfield 9, Mass.

M.I.T. Club of Central New York

Henry B. Kane '24, Director of the Alumni Fund, came all the way out to

Syracuse to speak at our May 1st meeting. We made the occasion a ladies' night, knowing that his lecture and colored slides about birds and animals would prove as interesting to wives and daughters as to the men. For those of you who may not know it, Mr. Kane is quite a naturalist and has written a number of books in the field of his hobby. His wizardry at photography is evident in the excellent and unusual pictures he has taken of "The Wild World." A fellow classmate, Fred Hungerford '24, introduced him, and an attendance of 40 attested to the interest aroused by Mr. Kane's visit.

This was our last formal meeting of the season, but we plan to have a steak roast in July. Ted Simonton promises to accommodate us at his place near Lake Cazenovia; but look out, fellows, we may wind up by helping Ted get his dock into the water, and that's some job.

Our list of members is increasing, and we are looking forward to some more interesting meetings next season. Several speakers have been lined up for these future programs, so come on, you fellows, and get behind your Club with lots of support. — D. EARLE MACLEOD '38, *Secretary*, 211 Columbia Avenue, Syracuse 7, N.Y.

Washington Society of the M.I.T.

Our annual ladies' night was held this year in the Blue Room at the Mayflower Hotel and was the most elaborate program so far in a year which Bill Mehafeff '17 has filled with a varied list of functions. After a few minutes of informal get-together, we assembled at the flower bedecked table for a five-course chicken dinner. "Sons of M.I.T." is a popular song with our group. The men like to sing it. During a pause in eating, we did it justice. Bill Mehafeff introduced as speaker of the evening Hiram B. Stout of the Department of State. Connected intimately as he is with Europe and problems there, he was well qualified to review the "Present Problems of Postwar Britain."

The British Isles are on the horns of a dilemma, according to Dr. Stout, because the economy of England cannot become stable without economic recovery of the world. He traced some of the tangled international situations contributing to Britain's perplexing trouble, including the Indian crisis and increasing independence of the colonies and dominions. The present confusion is the climax, said Dr. Stout, of 25 years of events which pointed like signboards to the economic confusion which we now see. The industrial revolution placed England in a dominant position in world trade, which continued prosperous until interrupted by World War I. That war caused a decline in British trade. Later, two world-wide economic depressions resulted in still further declines. Temporary palliatives such as Empire Preference were attempts to halt the trend and restore England's trade prosperity. War production for the recent strife sidetracked normal British world trade for five years or more, completing the disruption. In the meantime, industrial enterprises developed outside Britain and competed for former British business. During the war, Britain borrowed from the world to buy food and war materials. This money is spent, and billions more are

needed to convert England's war industries back to production of the goods for world trade. The measures England is invoking to help recovery are logical and should prove effective, said Dr. Stout, if no further wars aggravate the problem, and no world-wide depression comes to introduce uncontrollable factors. Much depends on the psychological stamina of the British who, it was admitted, are tired of rationing and by now anxious for some of the fruits of victory.

Present were: 1889: G. W. Stone; 1896: W. H. McAlpine; 1897: F. A. Hunnewell; 1904: A. M. Holcombe; 1909: E. D. Merrill, B. A. Robinson; 1911: C. P. Kerr; 1912: A. M. Pedersen; 1915: A. D. Beidelman; 1917: W. C. Mehafeff, T. K. Meloy; 1922: W. K. MacMahon, R. K. Thulman; 1926: S. J. Cole, J. Y. Houghton; 1928: A. E. Beitzell, G. D. Mock; 1929: J. A. Plugge, Raymond Underwood; 1930: A. F. Bird; 1933: Eloise Lawrence Gardner; 1937: J. R. Fischel; 1938: Paul Tillson; 1939: J. E. Greenhalgh; 1944: W. C. Sadler. — JOHN A. PLUGGE '29, *Secretary*, 35 Oxford Street, Chevy Chase, Md. ALBERT F. BIRD '30, *Review Secretary*, 5070 Temple Hills Road, Southeast, Washington 20, D.C.

CLASS NOTES

1887

William Leroy Hallett, who died at his son's home in Brooklyn, N.Y., on March 30, was born in Springfield, Mass., on August 8, 1856, the son of William Franklin and Mary Amelia (Jenks) Hallett. He was directly descended from Andrew Hallett, who came from England and landed on Cape Cod in 1637. Because of ill health, he went to Colorado in 1878 and made his home in Denver and Colorado Springs until 1940. For many years he had a summer home in Estes Park, Colo. In 1879, he married Elvena Ardel Sessions of Brockton, Mass. She died in 1931. They had five sons and two daughters, of whom three sons — William Jared, Robert Leroy, and Alfred Franklin — and two daughters, Miss Helen Ada Hallett and Mrs. May Margaret Bamford, survive him. He was in the cattle business in Colorado and Wyoming for many years; later, in mining and smelting in Colorado and Montana. In 1900, he took service with the Denver Union Water Company and was with it for 20 years. He retired from active business at the age of 80 years.

He was always very fond of hunting, fishing, camping, and horseback riding, and was a pioneer Rocky Mountain explorer; Hallett Glacier and Hallett Mountain having been named for him. He is buried in Fairmount Cemetery, in Denver, within sight of the Rocky Mountains that he so dearly loved. — GEORGE W. KITREDGE, *Secretary*, 592 North Broadway, Yonkers 3, N.Y.

1888

Three classmates named "Frank" have passed away recently: Frank H. Adams, 1524 Dover Road, Santa Barbara, Calif., Frank B. Meade, 802 Bulkley Building, Cleveland, Ohio, and Frank M. James, 61 Brown Street, Haverhill, Mass. Adams died on December 26; Meade, on March 22; and James, on March 29.

Adams left Technology at his father's request to go into the banking business in October, 1890, as cashier of the First National Bank of Akron, Ohio. He married Frances E. Robinson in October, 1891. In January, 1912, he was appointed treasurer of the Goodyear Tire and Rubber Company of Akron. He resigned in December, 1917, and retired from active business, settling in Santa Barbara, Calif.

Meade was the best baseball pitcher at the Institute from 1884 to 1887 and won games from several big college nines. He left Technology in 1887 to practice architecture in Cleveland, where he maintained an office for more than 30 years.

James went to St. Paul, Minn., with the St. P., M. and M. R. R. in 1888 and remained in the real estate business in St. Paul until 1891. He became associated with the Thompson-Houston Company in Lynn in 1892 and retired to Haverhill later.

Through the courtesy of Ralph Sweetland, who invited the Class to dinner, we met at the Algonquin Club on April 22 at 5:15, with dinner at 6:00 P.M. Members of the Class present were the following: H. D. Bates, John T. Cavanagh, Arthur J. Conner, Charles L. Faunce, Ralph Sweetland, John C. Runkle, and Sanford E. Thompson. After a fine dinner, for which the Algonquin Club is famous, the highlight of the evening was the reading, by the Assistant Secretary, of a report of James R. Killian, Jr., '26, Vice-president of Technology, on the wonderful participation of M.I.T. in World War II activities and on its current postwar program.

Fred Nichols, on April 20, addressed "Thompson, B. R. T. Collins, and the Bunch" from Orlando, Fla., as follows: "My desire is strong, but my flesh is weak. I'm feeling fine, but I have sense enough yet to realize that discretion is necessary. I don't have to be in everything — as I used to. I realize now that for the past few years my body has been trying to get me to understand that it was in bad shape, and I couldn't understand it. I thought I was doing a pretty good job — under real difficulties, thus: On October 17, 1945, my wife fell, leaving her desk, and broke her hip. Probably she never could have walked again, but we both failed to realize it. She was 87, six years older than I. We could get no help, either nursing or for the house, a little cottage here in Orlando. For five weeks I struggled alone with her, then got her into a nursing home. We failed to get an X-ray as we should have. Finally, I got her into a hospital and properly mended on March 5, 1946.

"On Thursday, March 31, I left for Chicago to see whether we could get her into a nursing home in Chicago. I went to my masonic lodge to ask them whether they would help me to do so. Yes, they said, but they grabbed me at that meeting and shoved me into the Illinois Masonic Hospital and had me fixed up in better shape than for 40 years. On April 12, with my operation over and my wife mended though still in the hospital in Orlando, everybody was happy. On April 24, the capable surgeon here in Orlando wrote me that her condition was satisfactory at that time. On May 11, however, she slipped away, surprising us all. Before that, she had been continually writing me, begging me to take her home and teach her to

walk, saying that the hospital was neglecting her—she couldn't understand it. 'Yes,' I said, 'just as soon as the doctor says so.' I have never had a setback, nor an ache or pain. I simply move slowly, carefully. Three years ago, I lost the sight of my left eye. For four months last winter I was in a room seven and a half by 12; on February 25 of this year, I moved into one 12 by 18, fine and comfortable. At first I thought I'd be with you on the 22d; then discretion said, 'Let it go till next year, which will be our 60th reunion.' See you then."

Your Secretary drove from Princeton to Chebeague Island, Maine, on May 1 and 2, stopping overnight at the Wellesley Inn and taking the car on the boat to the Island for the summer. He will return to Princeton about October 1. Three foxes were captured on the island during the winter and are being raised as pets by the islanders. The garden is plowed and harrowed, ready to plant, although the temperature was down to 25 degrees the other night. — **BERTRAND R. T. COLLINS, Secretary**, Chebeague Island, Maine. **SANFORD E. THOMPSON, Assistant Secretary**, Thompson and Lichtner Company, Park Square Building, Boston 15, Mass.

1889

The Secretary has news but no particulars of the death of Fred W. Ranno of Salem, N.J., on July 23, 1946. Frederick L. Hopkins of 21 Burnett Street, Providence, R.I., died on March 4. The following account of his life is from the Providence *Bulletin*: "Frederick L. Hopkins, who formerly served the Providence Journal in various news capacities for 25 years, died . . . at his home, 178 Terrace Avenue, Riverside. He was in his 80th year. Born in Manchester, N.H., Nov. 3, 1867, he was graduated from . . . Technology with the class of 1889. For many years he was a reporter, sports and Sunday feature writer for the Providence Journal, and also served for periods as night, city, and suburban editors. At one time he was editor of the Attleboro Sun. He left the Journal in 1919 to conduct for 14 years the plant publication of the Universal Winding Company. He was a former president of the Press Club and in his early days in Providence was active in the Orion Club, the Narragansett Boat Club and the Rhode Island Wheelman. Besides his wife, Lucy A. (Richardson) Hopkins, he leaves two daughters, Mrs. William L. Higgins and Mrs. Louis Brutting, Jr., both of Riverside; a granddaughter, Mrs. Owen C. Gretton and two great-grandchildren of Washington, D.C., and a niece, Miss Rachel Stannard of Lawrence, Mass. . . ."

The Northeastern University *Review* for March contained the following further statement about William Lincoln Smith, who passed away on February 21: "The University was saddened by the loss of one of its first members of the faculty, Dr. William Lincoln Smith, Professor Emeritus of Electrical Engineering, who passed away on February 21, 1947, following a long illness. A graduate of . . . Technology in 1890, he joined the Northeastern Faculty in 1909 and served as Chairman of the Department of Electrical Engineering from 1917 until 1937 when he retired as Chairman. He continued to teach two advanced

courses until 1946. A pioneer in the development of electrical illumination, he was associated throughout his long career with many scientific, educational, and civic organizations. Northeastern University awarded him the honorary degree of Doctor of Engineering in 1937. Dr. Smith will be fondly remembered by many thousands of Northeastern students who sat in his classes during the four decades that he taught here. Two of his sons, Farnham and Benjamin, are alumni of Northeastern as is a grandson, Thomas Hollis. Dr. Smith was in his eightieth year."

L. E. Johnson is back at the Grayfield, Chautauqua, N.Y.; and Zenas Bliss is at 238 Armington Street, Edgewood, R.I. — **WALTER H. KILHAM, Secretary**, 126 Newbury Street, Boston 16, Mass.

1891

The Alumni Association has notified us of the death of two men in our Class.

Harry E. Cormier died on March 2. His home was in Charlestown, Mass., and for many years he has been the proprietor of a large dry goods store in that city. He was a special student at the Institute, and it is doubtful if we have had any contact with him since we left Technology.

Ralph D. Colburn died on March 12. He lived in Holliston, Mass., for most, if not all, of his life. He was married and as listed in our Fiftieth Reunion Book had one daughter, one son who attended Technology, and two grandchildren. He was for many years a contractor in Holliston, for plumbing, heating, and electrical work. Ralph came to our 45th, and to some of our dinners, but we have not seen him during the last few years.

The Arts and Crafts had a show window display in Filene's Store in Boston, during April, and the following is from the Boston *Herald*: "An outstanding example of handiwork to be shown is a miniature colonial dining room, made by Walter B. Douglass of Dunstable. It is a scale reproduction of a room in the home of his great-great-grandfather." Walter writes of his work as a farmer. It sounds pretty strenuous, but he may calm down before the summer. His letter is dated April 11, and you will note mention of 70 degrees F. This is written on May 10, and for most of the week the temperature has been close to freezing, which shows what eastern Massachusetts can do when it so pleases. Walter says, in part: "These days make the out-of-door work take my attention. The temperature here at noon today is 70 degrees in the shade; hence I was out all day. I rose at 5:45 A.M. and quit work at 4:30 P.M., with time out for dressing, breakfast, and dinner. A bath at 4:30 P.M. made me ready for a good supper. That will be the approximate schedule for some weeks now, but, of course, I get some days off, and I shall be glad to take time out to greet and converse with any friends who can come out to see us. We have no union restrictions yet on farmers out here in Dunstable, but no doubt will be entertaining infiltrated communists here soon. We'd be most likely to find them in the Grange, don't you think? Anyway, I'm going to investigate. Tomorrow evening we go to a meeting of Pomona, and I'll keep eyes and ears wide open. If anything suspicious shows up, I'll wire you at once."

Charlie Garrison wrote to Ernest Tappan on February 29, and part of his letter follows: "I seldom see Bert Kimball but see his sister, who is not far away. My brother Frank is staying with me, and he is a great cook and housekeeper. We have recently returned from a visit to my son at San Marino. We have a very good hotel here, the El Encanto, where my brother and two sisters and Margaret's sister Fannie and I have our noon meal together. My son, a petroleum engineer, lives in San Marino, and his son has recently gone to the University of Colorado at Colorado Springs. On January 17, son Bob took brother Frank and me to the train at San Marino, from where we rode to Trinidad, to meet my grandson, who had driven his car from Colorado Springs. We three drove his car back to San Marino, as he could not use it at the Springs with several feet of snow. Our way home took us from 10,000 feet elevation to below sea level."

Charlie Ricker's son writes from Evanston, Ill., and gives further information about his father, who has for some months been in a convalescent home in Evanston. Charlie is confined to his room, but otherwise comfortable, and has every care, a pleasant room, and good food. He is not able to write and greatly appreciates letters from his friends and classmates. Mail should be sent to his son's house, 2413 Central Street, Evanston, Ill.

Changes in address are as follows: Medorem W. Greer, 2609 California Street, San Francisco, Calif.; Morris A. Peters, Kure Beach, N.C.; and Alexander W. Moseley, 807 Milburn Street, Evanston, Ill. — Stephen Bowen is stopping at Milton Hill House, Milton, Mass. (summer address). — **HENRY A. FISKE, Secretary**, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

1895

Fred W. Draper passed away on January 30. Fred was a Massachusetts boy from Marlboro. For years he followed closely his profession as a mining engineer. After leaving Technology, he was assistant superintendent of the Chicago and Aurora Smelting and Refining Company; next, he held the professorship of metallurgy at the Missouri School of Mines; during 1901-1902, he was superintendent at the Rocky Mountain Smelting Company, Florence, Colo. In the following year he served as superintendent for the Coahuila Mining and Smelting Company in Viesca, Coahuila, Mexico. Mexico was his first foreign assignment. In 1903, he became superintendent for the Mazapil Copper Company at Concepcion del Oro, Zacatecas, Mexico. He returned to the States, first as assistant general manager of the Duquesne Mining and Reduction Company, Duquesne, Ariz., then as superintendent of smelters at the Consolidated Arizona Smelting Company, Humboldt, Ariz. His next experience was in Russia as consulting engineer on the Poklensky-Kozell Estates at Ekaterinburg, and later with the South Ural Mining Company, Verk Isetz Estates, and the Altai Mines, Ltd., Petrograd.

Tech men, and especially our '95 boys, will recall Fred's unique and successful experience in bringing out of Russia in 1918, 21,000 ounces of platinum, singlehanded, at a time when the Kerensky government

was falling and revolution was rampant. Draper had a rather charmed life; but-tressed by his Yankee ingenuity, he passed through many mining experiences the tale of which reads like fabulous fiction. He saw most of the world, and his mailing addresses even included Australia. From Australia, in 1929, he returned to California, still mining, and finally, in 1944, he settled down in Portland, Ore., where he completed his wonderfully exciting and successful professional life.

It takes months, at times, to get direct information from some of our mates, but finally we do catch up through news from the Alumni Association's ever alert Register of Former Students. Thus were we informed that Joseph C. Walier of Solvay, N.Y., had passed away on December 8. For some years he had lived in Syracuse, N.Y. In 1934, he moved to Solvay, where he remained until his death.

We understand that George A. Cutter has moved from Dedham, Mass., to his "other" home, at Queene Ann Road, Chatham, Mass. This brings George to a spot favoring his seafaring propensities.

Gerard Swope may well be proud, and probably is, of his daughter Henrietta, who, after a most interesting and successful career in the astronomical field, is now in the Navy Hydrographic Office in Washington, assisting in polar navigation. Her experience in charting the skies, as well as her genius for mathematics, makes her invaluable in the preparing of charts which the navigators use. Before the war was over, she had charted more than a quarter of the globe, so that when the system of radio guide posts may be expanded to include all parts of the world, no ship or plane need ever be doubtful of its position.

For some months we lost track of our genial mate Sid Clapp. Under date of May 15, he writes that he had reason for "keeping to himself," since he was confined to a hospital suffering from *erythema nodosum*, a sort of inflammatory skin disease with nodules. After his hospital sojourn, he spent many weeks in Florida, taking advantage of the sun and climatic conditions. He has now returned, feeling much better. We are glad to hear from him and send best wishes for his continued recovery. He will be glad to hear from you; write him at 21 Janet Street, Kingston, N.Y. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

1896

The Secretary received a call from Butler Ames on May 5, and Butler appeared to be as fit as a fiddle. He reported that he had made two trips to his villa on Lake Como, one last summer and the other in the fall, and it had escaped damage entirely during the war, having been kept in first-class condition by his tenants. Butler also reported that his infrared stove was progressing remarkably well and held much promise for the future. He is following developments in the United States and abroad and had recently returned from a trip to California connected with his invention.

Our classmates seem to be on the move. Henry Cummings, who has for years been in Epping, N.H., now has a new address at P. O. Box 180, Newmarket, N.H. Charlie Hapgood, who retired a year or two ago, but continued to reside in Boston, has now

gone to Fitzwilliam, N.H. Henry Hedge has changed his mail address to 105 Rockwood Street, Brookline 46, Mass., and Con Young reports that he arrived from the South on May 5 and is now in residence on Cape Cod. Billy Anderson reports that he and Mrs. Anderson spent a week in Wellesley in February visiting their son and getting acquainted with their new granddaughter, Margot, who was born last September. Unfortunately he did not get to Boston, so that the Secretaries did not see him. Billy expects to spend the summer at Biddeford Pool and is leaving Cincinnati about June 10.

Doc Coolidge is receiving publicity in the daily press, having given a check of \$1,500 as a memorial to his parents to the Hudson Hospital Association in Hudson, Mass., where he spent his boyhood days. — Charlie Locke is making an unusually good convalescence from a very serious operation which he underwent on May 13, and as of May 26 is reported very comfortable now. He has been up and about for the last day or two, and aside from some general weakness is in good condition. — John Rockwell left with Mrs. Rockwell on May 23 for a 10-day fishing trip at the Spencer Bay Club, Moosehead Lake. Fred Damon will be there at the same time.

The passing of two classmates is noted with regret. Arthur W. Hodges died on January 16. He was a student with us for two years in the Department of Electrical Engineering and later attended Harvard University. He had been located as a civil engineer in and around Boston and had for many years been connected with the Massachusetts department of public utilities. Miss Lucy D. Thomson died on September 20, 1943, but only now has the information been received. She was graduated in Architecture with our Class and followed a career as draftsman in Springfield, Boston, Providence, New York, and Pittsfield, Mass. She had held the position in Pittsfield for a long time. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge 38, Mass.

1897

From the New York *Tribune* of April 22 we learn of the death in New York City on April 21 of Warren D. Brown, VI, retired electrical engineer. Mr. Brown was an electrical engineer with the International General Electric Company in Paris and Berlin from 1897 to 1903. While in France, he operated an electrical moving sidewalk at the Paris Exposition in 1900. He retired from business in 1910. He was a graduate of Amherst College. His club affiliations included the University Club of New York City and the Knollwood Country Club of White Plains, N.Y.

Word has been received of the death in Chicago on November 12 of Horace Manning, V. For many years he was a partner in the firm of Ernst and Ernst, certified public accountants of La Salle Street, Chicago. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

1898

The Secretary has been working for the past fortnight on the Class Agent letter and is about all written out. Although there is

interesting material for more class notes on his desk, the work on the Class Agent letter has turned his mind into another channel. This turn is also influenced by the fact that the July issue of *The Review* is the last one of this Review year. The next issue will be in November.

We have been amazed at the large number of names listed under '98. Many of these conjure up faces of eager classmates of 50 years ago, and still more cannot be visualized at all. It is impossible, of course, to manufacture class notes from such nebulous material. Yet how much human interest these many names must encompass! We wish to thank the 24 classmates who, during the past eight months, have either written or called. It gave the Secretary great pleasure and also from credible evidence pleased other classmates. There are about 60 classmates who receive *The Review* regularly and then some 130 more who are outside the charmed circle. How about a concerted effort to make the reading of *The Review* 100 per cent, and — breathe it softly — the furnishing of material for the class notes, 100 per cent by doing your share?

"But," you say, "I am no writer; and there is nothing of interest to write about, anyway." Don't you believe it for a minute! The thrill of hearing from an old friend, whom you have not seen for 10 to 50 years, is beyond description; and details that seem trivial to you will greatly interest your classmates. Those who have already written will readily find fresh material. Don't hesitate to give '98 a second or third benefit from your experiences. (This will encourage those afflicted with bashfulness or hand cramp or what will you!) If you wish to hear from any particular classmate, write a letter to him or to her. If you do not know the address, send the letter to the Secretary, who will forward it to the latest known address.

And here we stick out our neck. How about suggestions for improving the class notes? That should be easy. Get another Secretary; or have two or three or more assistant secretaries in different parts of the country. Send along your suggestion, however the chips may fall. And so we conclude the season by wishing one and all a pleasant and enjoyable summer. — EDWARD S. CHAPIN, *Secretary*, 463 Commercial Street, Boston 13, Mass.

1899

The Boston *Herald* published an obituary of Frederick R. Sites which read in part as follows: "Frederick R. Sites, 68, a former executive of the United States Steel Corporation, died . . . at his home, 12 Cedar Road, Swampscott [on April 29]. He was secretary to Judge Elbert Gary, chairman of the board of U.S. Steel for many years. Born in Foochow, China, of missionary parents, he was brought to the United States at the age of two. He lived in Washington and Auburndale and was graduated from . . . Technology in 1899. He worked for the Ritter-Conley Manufacturing Company in Pittsburgh and New Haven before joining U.S. Steel in 1918 as treasurer of the Federal Shipbuilding Company in Kearny, N.J. In 1919, he returned to China as manager of the U.S. Steel Products Company in Shanghai. In China, he was a member of the Associated Boards of Christian Col-

leges and one of the organizers of the Community Church in Shanghai. He returned to the U.S. in 1922 to become secretary to Judge Gary. He was a director and chairman of American Youth Hostels of Northfield and a member of the First Church Congregational of Swampscott. . . ."

Waddell, whose address is 705 Fourth Avenue, Bethlehem, Pa., writes about Sites as follows: "Sites and I were close friends during our college years. Afterwards, he served as an usher at my wedding in Boston in 1901, and about five years later I performed the same duties for him at his wedding in Schenectady." We regret to hear that Waddell's wife has been ill for about three months after an operation. News has been received of the death of Robert Frazier on April 6 in Santa Barbara, Calif., as follows: "After graduation from . . . Technology, Frazier served as U.S. Consul in Spain, Brazil, and Kobe, Japan. He was consul-general-at-large in Latin America and Western Europe from 1919 to 1924 and held posts in the Far East, Mexico City, and London before being named minister to El Salvador. He retired in 1943. Survivors include his wife, Olivia, of Santa Barbara, and a sister residing in Washington, D.C." Charles S. Drake of Wichita, Kansas, died on March 19, but we have no further details. — BURT R. RICKARDS, *Secretary*, 381 State Street, Albany, N.Y. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston 9, Mass.

1901

Mary Abbot Holt writes that she took a teacher's course in biology, with lectures and laboratory work. She says that she retired years ago and is now 81.

Angus MacInnes is assistant in charge of pricing for the Walsh Construction Company, disposal agent for the War Assets Administration, located in Building 77, New York Naval Shipyard. During the war he was chief purchasing agent for the Walsh Construction Company on the construction of Camp Edwards at Falmouth, Mass.; chief purchasing agent for the Walsh-Driscoll Company on construction of the Trinidad Army Base; chief purchasing agent for the Walsh-Kaiser Company, Inc., building 64 ships for the Navy, including Liberty ships, Frigates, and A.K.A.s.

Ed Church writes as follows: "I am retired, writing a book or two, and catching up on many things I have never previously had time to do. I am nevertheless continuing, by a small part-time connection, with the Polytechnic Institute of Brooklyn, where I was located for 28 years." — Theodore Taft says: "Charles A. Whittemore's address is 66 St. Mary's Street, Newton Lower Falls, Mass. He is with Stone and Webster."

George Shute sends the following report: "I believe I should still be classed as a bookkeeper, although I should not rate top-notch under that heading. We are still busy closing out the accounts of the company which has occupied most of my time since 1921. The Secretary of State dissolved the corporation on December 31. The state sale tax people have taken about two months of my time to examine each and every sale since June, 1942, and finally decided that we owed nothing. Now we have the income tax, and then I hope we are

done. I plan then to move out of the book-keeping class and be an engineer. Some thought should be taken, these days, before becoming an engineer. The Ohio State University has 4,300 men registered in the college of engineering and only 318 medical students. It is a grave question whether so many engineers can make a respectable living in the practice of the profession. I believe the National Society of Professional Engineers best assists in promoting the professional and economic status of the engineer. The last monthly meeting of the local chapter of the Professional Engineers was held at the Battelle Memorial Institute, Columbus; and on this occasion the latest development in gas turbine locomotives was presented by C. F. Kottcamp, assistant director of research for the Locomotive Development Committees. The lecture was very interesting to Course X."

Carl Johnson reports that his present occupation is in technical aviation education. He is owner and operator of the Instrument Flight Institute in Los Angeles, Calif., and Reno, Nev., which gives advanced flight training covering instrument flight, radio navigation, the manufacture of radar equipment for the Navy, meteorological instruments, and air-conditioning devices. "I have a son," he says, "William Warren Johnson, who was in the Marine Corps during the war and spent considerable time in the naval hospitals at Pearl Harbor and Oakland, Calif. He organized and commanded the Sixth Wing, Ninth Corps Area, of the Civil Air Patrol, created the first mounted unit of the C.A.P. in the United States. This unit located many crashed airplanes and brought out the bodies during the war. It supplied planes and pilots for coastal patrol in the Gulf of Mexico. My nephew, Seymour Johnson, was sent to M.I.T. during the war to help develop radar. During his experiments he made a notation in his log of a reaction from the moon but made no public announcement. A considerable time later, the Navy announced it had obtained such reaction. He is presently engaged in setting up frequency modulation and television stations on Mount Wilson at Pasadena, Calif., for Station KFI in Los Angeles, Calif."

Leroy Backus writes from Seattle as follows: "I have recently purchased a small desert home in Phoenix, Ariz., where my family and I have spent the last several winters." — Alex Jeffords says: "I have not been doing much but work for the past 45 years and feel I shall continue at the present pace for many years to come. I have not seen a classmate, except Lammot du Pont, for 20 years. I doubt whether any of them would remember me. However, since that situation is largely my fault, I will endeavor to correct it by attending the next class reunion. I hope to see Joe Evans some day."

Wilford DeBerard writes as follows: "A recent letter from Perkins Boynton, chemist in charge of the filtration plant at Clarksburg, W. Va., resulted from notes sent you and printed in *The Review* for June, 1946. He has a daughter here in Chicago and visited her last summer but could not locate me. It evidently pays to write you our addresses. Boynton reviewed many of the classmates, some of them now gone, including Ralph Stearns, Albert Higgins,

Warren Taylor, A. J. Taylor, Ted Kendall. Finally, he says he has managed to keep alive the 30,000 inhabitants of Clarksburg for the last 23 years; that is, 'alive' and well so far as water-borne diseases go. It was a treat to hear from him, and I consider it well paid for the few minutes spent in sending in notes on what I had been at. The 320-m.g.d. filter plant I wrote about is now one-half in operation, and the customers are beginning to brag about the 'sparkling clear water' coming to them."

Ed Davis philosophizes as follows: "Seeking a new adventure to enliven a too mellowing old age, I am considering swearing off smoking (visualize Ed's pipe here). A supporting argument is the tremendous rise in the cost of tobacco. A counterconsideration is the uneasy suspicion that doctors might approve, a risk that, at my time of life, I am reluctant to take. More in my next. I was interested to note that at our 45th, there was an apparently total unawareness that a greater change has occurred in the lives of all Americans than had occurred to our group in 1901. If only one of our gang had been hooked up with the Manhattan Project, we might have decided to start a new series of anniversaries probably appointing them annually just to be sure of getting some of them in!" I am not sure that I get Ed's idea fully but Charlie Bittinger would perhaps fill the bill, as he was at Bikini. (See next paragraph.)

Charles Bittinger reports himself as a captain in the Naval Reserve — so far as known the oldest '01 man in the service — who received the Legion of Merit on the 14th of March, 1946, and was a member of J T Force at Bikini for the atomic bomb tests. "I hope to be able to resign from the Navy this summer," he says, "and go to Duxbury, Mass. Look me up when you visit your stepmother." Charlie's summer home is within 150 yards of the house where I was born, and I shall look forward to seeing him.

Anna Gallup, VII (retired), writes the following: "More than a year ago I intended to write to you and was on the point of making out my check. Then things happened. My brother dropped dead, and my sister, M.I.T. '94, had died suddenly only a few months before. I gathered my household goods for storage and kept them there until I could find an apartment. My letters and papers were all in my file, and I couldn't do anything except from memory. Very recently I have acquired an apartment, in which I am settling and living, at 47 High Street, Mystic, Conn. Now I have access to things, and I am sending you my check for two years' dues."

Joe Catlin retired as vice-president and treasurer of the Wood Newspaper Machinery Corporation on February 1. He says: "I expect to re-enter active business as consulting engineer for the Racine Universal Motor Company in Racine, Wis. I shall continue as director of the Phelps Can Company in Baltimore, Md., and am also director of the Virkotype Corporation of Racine, Wis." — Langdon Pearse sends this report: "I understand that Professor Frederic Bass has returned to Minneapolis after a sojourn in Chicago. He is emeritus at the University of Minnesota."

A note from Theodore Lange says, "I was very much pleased with your interest-

ing and complete report. Our M.I.T. Club of the Connecticut Valley has had a successful season. Charlie Locke '96 attended two of these meetings, which our Secretary will report to The Review. I hope you and Mrs. Peterson can arrange to stop over for a visit this year. I am anticipating talking over old times with you and meeting your wife."

Russell Putnam writes: "I have recently completed my 38th year at the Waterbury Clock Company, now the United States Time Corporation, where I am engineering assistant to the president, who is an M.I.T. '19 man. We manufacture the famous Waterbury clock and Ingersoll watches. Mrs. Putnam and I live in the little town of Prospect, adjoining Waterbury, where we built our little house in 1937. From the picture window in our living room we overlook the 'Hanging Hills of Meriden,' and on a clear day we can see the tower of the Travelers Insurance Company Building in Hartford. We have a daughter, Mrs. Harry R. Lange of Waterbury, and a son, George C. Putnam (M.I.T. '36) of Westfield, N.J. There are also six grandchildren."

Joe Evans reports: "Since the first of the year I have had three attacks of grippe, in which I lost 16 pounds in weight, but am beginning to feel much better. I am president of the Omaha alumni chapter of the Sigma Chi Fraternity, also president, for 1946-1947, of the Continental Club, Omaha, a businessmen's club for fellowship. Both organizations hold weekly luncheons. I am planning to leave Omaha the last of May; attend my 50th class reunion at Phillips Exeter, then the M.I.T. Alumni Day Celebration on June 14; and afterwards spend the remainder of June, July, and August along the seashore in New Hampshire and Massachusetts. I hope to see you this summer." To those who met Mrs. Evans at our 45th reunion last year, I must report the sad news that she was taken ill a few days after the reunion and at the beginning of an intended trip of several months' duration, in Maine, Canada, and Minnesota. She died in a hospital in Lowell, Mass., on July 6, 1946. Mrs. Evans was the former Mrs. Nellie May Baker of Omaha, Neb.

I report with regret the death of Joseph A. Garvin in a hospital in Pueblo, Colo., on January 4. We have no further information about him except that he had been a patient in the hospital for several years of illness.

The following article appeared in the *Canadian Mining and Metallurgical Bulletin* for March: "It has been announced that Dr. F. H. Sexton, founder and for forty years President of the Nova Scotia Technical College, Halifax, will retire from that position in May and that he will be succeeded by Dr. Alan E. Cameron, Deputy Minister of Mines for Nova Scotia.

"Frederick H. Sexton was born in New Boston, N.J., on June 9th, 1879, and received his early education in the public and high schools in Billerica and Cambridge, Mass. He then entered . . . Technology where he took the course in mining engineering and obtained the degree of B.Sc. in 1901. He remained at the Institute for one or two sessions as Assistant in Metallurgy and then was Research Metallurgist with the General Electric Company at Schenectady, N.Y., until 1904, when he accepted

the position of Assistant Professor of Mining Engineering at Dalhousie University, Halifax. When, in 1907, the Nova Scotia Technical College was established — the first of its kind in any Canadian province — he was appointed President, and also Provincial Director of Technical Education. It is from these positions that he is now retiring after forty years of eminently successful and abundantly fruitful service. Since the college opened its doors, more than 800 students have received degrees in engineering and have found employment in every province of Canada and in many foreign countries.

"As Director of Technical Education, Dr. Sexton was responsible also for the development of evening technical and coal mining schools in Nova Scotia, which last year had an enrollment of 4,108 students in thirty-six communities. In 1921, he established correspondence courses, a service which has proved especially valuable to students in remote districts and which now offers more than one hundred academic, commercial, and industrial courses. In 1927, he was successful in securing the co-operation of industry in the establishment of indentured apprenticeship training, under which young men working in the principal industrial plants are permitted by their employers to attend technical classes for one half-day a week, with pay. This form of co-operative training is now established throughout the Province. Following the first World War, Dr. Sexton organized a wide variety of short-term technical courses for veterans and others, and during and after the recent war he was, as Regional Director of Canadian Vocational Training, responsible for the organization and direction of war emergency training, student aid, rehabilitation training, and re-establishment of civilian workers.

"From this necessarily brief and incomplete record of the work accomplished by Dr. Sexton during the past forty years, it will be evident that he is a man with apparently limitless energy and quite exceptional administrative ability. To quote from the tribute paid him by Premier Angus L. MacDonald, of Nova Scotia, in announcing his impending retirement, 'He has not only been a great educationalist in the purely technical sense of the word. He has been an outstanding citizen of the Province. The affection of former graduates of the Technical College for their President is sincere and universal. To them, Dr. Sexton and the College have become almost synonymous terms.'

"Dr. Sexton is a member of the Canadian Advisory Council on Vocational Education, Vice-Chairman of the Atlantic Coast Committee of the Canadian Legion Educational Service, Director, Maritime Division, National Institute for the Blind, and a Trustee of the Maritime Foundation for the Blind. His services in the cause of technical education, in various capacities during the war, and to the mining industry, have received tangible recognition on many occasions. He was the recipient, in 1919, of the honorary degree of D.Sc. from Acadia University, and in the same year of the LL.D. degree from Dalhousie. In 1943, he was created Commander, Order of the British Empire (C.B.E.) 'for leadership in patriotic and philanthropic work.' He is a past-President of the Mining Society of

Nova Scotia and at present is a member of Council of that Society. For the terms 1917-24 and 1931-33, he served as Councillor, C.I.M.M. He is also a past-President of the Canadian Education Association and of the Nova Scotia College of Art, and a former District Governor of Rotary International. In 1931-33, he was Chairman of the Committee which revised the Nova Scotia public school curriculum.

"We take this opportunity of extending our most sincere good wishes to Dr. Sexton on his retirement as President of the Technical College and of expressing the hope that he may enjoy many happy years of well-earned leisure." — GUY C. PETERSON, Secretary, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, Assistant Secretary, Room 3-266, M.I.T., Cambridge 39, Mass.

1903

From the *Electrical World* for February comes information of the retirement of William E. Mitchell, VI, from the Georgia Power Company after serving as president since 1945 and 20 years as general manager. Before that he was with the Alabama Power Company in various executive positions. Mitchell took a leading part in the civil and public welfare activities of Atlanta, as well as managing company affairs with conspicuous ability, according to the *World*. He has apparently earned a good vacation, and we wish him the best of life as he leaves active service.

M. C. M. Hatch, II, died at his home in Provincetown, Mass., on April 5. He had made his home on the tip of the Cape for many years and during that time dug into the early history and unrecorded stories, writing a very entertaining book about Provincetown, Truro, Wellfleet, and other towns on the lower Cape. He leaves his widow, Isabel (Rawlings) Hatch and two children. — The *Hartford Times* records the death of Herbert M. Bacon, V, VI, in West Hartford, Conn., on March 19. He was a chemist at the Bacon Bottling Company and leaves his wife, Isabel (Huntington) Bacon, and one daughter.

Caspar A. Schmidt, III, superintendent of operations of the Empire Zinc Company at Hanover, N.M., since 1914, retired on February 1. He is one of New Mexico's prominent and active mining engineers and executives. We congratulate him and hope he will enjoy a well-earned and extended visit in California with his wife and daughter.

Your Assistant Secretary has been re-elected the class representative on the Alumni Council for the next five years and will be glad to supply you with information about the doings of the Council upon request. — FREDERIC A. EUSTIS, Secretary, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, Assistant Secretary, 441 Stuart Street, Boston 16, Mass.

1907

In the May notes I told of the serious sickness of Armen Tashjian. Death came to him on April 3. I at once wrote again to his daughter, Betty Tashjian Backus, whose name was mentioned in May, extending sympathy to her, her mother, and her brother and sister in behalf of the Class. Under date of May 6 came a gracious reply, enclosing two clippings from which I

quote. An editorial in Cleveland, Ohio, *News*: "Armen H. Tashjian will be remembered in Cleveland as architect and engineer for many of the city's important buildings. His skill and inspiration are preserved in public and church structures numbered among the probable landmarks of this time. He will be remembered also as a symbol of the opportunity which America holds forth to individuals. Mr. Tashjian came to this country from Armenia as a stranger. He became nationally known and respected by the force of his own application and genius. His death will be mourned by those who had the privilege of association with him in his years in Cleveland." From the Canton, Ohio, *Repository*: "Armen H. Tashjian, nationally known architect and engineer who came to Canton in 1941 as consulting engineer for the Union Metal Manufacturing Co. . . . had been in ill health for more than two years. . . . He was possibly best known for his invention of the 'rivet grip' system of steel reinforcing for concrete in bank vaults. Born in Erzurum, Armenia, he was graduated with honors from Anatolia College in his native land. While in school, he showed promise as an inventor, having built the first wireless set in that country. He came to the United States to further his education, attending Sheffield School of Yale University and later . . . Technology, where he received degrees of bachelor of science in 1907 and master of science in 1908. During 1909-1910 he taught the first course at the Institute in the theory and practice of concrete design. . . . During World War I he designed concrete ships for the government. He was the engineering expert for many of the better known structures in Cleveland, including the Cleveland Discount building, Federal Reserve Bank, the main building of the public library, the new Cleveland Post Office, several large churches, Allen Memorial Medical Library, Cleveland Stadium, the new buildings of Case School of Applied Science. He was also engineer for the nationally famous World War I memorial in Indianapolis and the Ohio Memorial in Belgium. . . . He was a member of Cleveland University Club, past president of the Cleveland Chapter of the American Institute of Architects, Cleveland Engineering Society, Technology Club of Northern Ohio, Cleveland Museum of Art, and Calvary Presbyterian Church of Canton. . . ."

A clipping from the Bridgeport, Conn., *Telegram* of April 29, thoughtfully sent to me by Howard Marvin, tells of an address given before the Chamber of Commerce of that city by our Hud Hastings, professor of economics at Yale University. — A clipping from the Newark, N.J., *Star-Ledger* of April 10 and also a copy of a sample ballot in the Newark *News* of May 12, sent to me by Dennie '11, tell of Allan Cullimore's being a candidate for a delegate to the forthcoming New Jersey state constitutional convention. Comments in the article concerning our classmate, who is president of the Newark College of Engineering, refer to his being a major during World War I, doing rehabilitation among crippled war veterans, and include the statement that he was the first amputee to be given a commission in the United States Army. This latter fact I did not realize before. You fellows will recall that he lost

his left arm while a young man. — In the Boston *Herald* of May 6, my attention was drawn to a cut of a young man lying on a couch apparently studying with an electrical device near at hand, and under the cut were these words: "In a New York hospital David Greenburg of Tel Aviv and Newtonville continues his Boston University course with wire recordings of the lectures." David is a son of Max Greenburg. The accompanying story states that David was forced to leave college for a polio operation last March, and through the co-operation of the college professors and the International General Electric Company president, who lent him a wire recorder, as result of the request of our Max, who represents General Electric in Tel Aviv, he is able to keep up in his studies. The teachers use a lapel microphone as they deliver their lectures to David's classmates. Three or four are recorded daily, and a week's supply is shipped to the hospitalized student, who returns the spools of wire to be erased and re-used. This young man really wants an education!

Henry Martin is a project engineer with the Federal Works Agency of the government, Bureau of Community Facilities, now being at work on some college buildings for State College, Dover, Del.; Washington College, Chestertown, Md.; and the University of Maryland at Princess Anne, Md. His home address is 39-41 Langley Court, B-578 McLean Gardens, Washington 16, D.C. — Johnnie Thomas, 99 Magellan Avenue, San Francisco, Calif., indicates on his registration for our 40-year reunion that he is now retired from active business. — Lester Brock is secretary and treasurer of the Caldwell Company, chemical manufacturing and sales to the rubber industry, First Central Tower, Akron, Ohio. — Ed Moreland, Executive Vice-president of M.I.T. and senior partner of Jackson and Moreland, has a new home address, 4 Berkeley Court, Wellesley Hills 82, Mass. — Charles E. Baker, Box 109, East Point, Ga., is general manager of the Dixie Printing Ink Company. — Albert F. Stevenson is general production manager of the Borden Company, 350 Madison Avenue, New York City. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

The fourth and final dinner meeting of the Class for the 1946-1947 season was held in the Silver Room, Walker Memorial, on Thursday evening, May 15. The following were present: Winch Heath, Jeff Beede, Doc Leslie, Linc Soule, Harold Gurney, Toot Ellis, Myron Davis, Bill Booth, Joe Wattles, and Nick Carter. Brother Bridges served his usual fine dinner, this time roast beef, while the fellows seemed to have plenty to talk over. After dinner, Harold Gurney showed some interesting and excellent Kodachromes of scenes in Guatemala, California, Arizona, Utah, Oregon, Alaska, and Hawaii. Joe Wattles showed Kodachromes of flower gardens and flowering shrubs, taken on a recent trip south, when he visited the well-known gardens at Orangeburg, S.C., and the cypress and magnolia gardens at Charleston, S.C. Linc Mayo, Sam Hatch, Mat Porosky, George

Belcher, and Bill McAuliffe had expected to be with us, but couldn't make it. Stiles Kedy was confined to his home by illness. Here's hoping for an early recovery. The change to Thursday evening prevented George Freethy from coming. George doesn't miss many, however. Fred Cole is still tied up on a construction job in northern Maine.

I'm sorry to report the loss of another good, staunch member of the Class with the death of Alton Mace Cook on March 28. Cookie's never-failing cheerfulness and courage were remarkable, when one realizes that for two or three years he had been under medical care for ulcers but was active in his business every day. Within two weeks before his death, he had had two serious operations. They were successful, but in his weakened condition he was unable to survive a severe heart attack. Alton was born in Provincetown, Mass., on February 22, 1887, and received his education in the schools there and in Hyannis, Mass. During the summers, while at Technology, he was surveying for railroads on the Cape. After graduation he was with Stone and Webster until June, 1921, when he became associated with J. Williams Beal Sons as an advertising agent. In April, 1925, he entered the employ of the Library Bureau, continuing until December, 1930, when he joined the Bankers Electric Protective Association as salesman for bank and vault protection in New England, a position he held at the time of his death. In April, 1942, he was elected a director and appointed clerk of the organization. His wonderful personality enabled him to close contracts with all the principal large banks in New England.

He was never too busy to do things for the Class at any time, and as class agent he did a wonderful job of putting '08 in the standing among the other classes that it now holds. He was interested in all Masonic activities having been brought up in Fraternal Lodge in Hyannis, and was a member of St. Paul's Royal Arch Chapter, DeMolay Commandery, and Aleppo Temple, the last three organizations being here in Boston. On October 3, 1917, he married A. Marguerite Mosman, who survives him, as does a daughter, Virginia Jane Cook. In 1924, he built his delightful home at 38 Wachusett Road, Chestnut Hill (a part of Newton), Mass., where he has lived ever since. The funeral services, held at the Forest Hills Crematory on March 31, were absolutely private, for the immediate family only; but Linc Mayo, who was one of his oldest friends, was asked to attend and so was able to represent the Class. We shall all miss Cookie at our future meetings and reunions, and no one can replace him. I know that every member of the Class joins with me in extending deepest sympathy to his widow and daughter in their great sorrow.

The death of Jesse K. Flanders, which occurred on February 28, 1946, is also reported with regret. Mrs. Flanders writes as follows: "Dr. Flanders took his master's degree at Stanford University in 1917. He was a graduate student at the University of California in the winter, and Stanford in the summer. He became professor of education at the University of Hawaii, 1920-1922, and a graduate student at Columbia, 1922-1925. He received his

Ph.D. in 1926. He corrected, checked, and prepared for publication the results of several investigators in the educational work of the Young Men's Christian Association in New York City in 1923. From 1925-1935, he was director of training and superintendent of practice at the Oswego State Normal School. From 1935-1945, he worked chiefly with the Teachers' College bureau of educational research. He took part in many school surveys, including those in St. Louis, Pittsburgh, New York City, and Boston. His dissertation was on the "Legislative Control of the Elementary Curriculum." He was a member of Phi Beta Kappa and Phi Delta Kappa."

Myron Davis reports that Loyd Sutton has been elected president of the American Patent Law Association. Loyd is a member of the Washington law firm of Cameron, Kerkam and Sutton, and adjunct professor of law at George Washington University. Jim McGowan, Jr., was recently elected as a term member of the M.I.T. Corporation. Again congratulations, Jim. Greg Dexter, engineer manager of W. W. Slocum and Co., Newark, N.J., has become a partner in the subsidiary known as Slocum, Dexter and Company, engineers, also of Newark, N.J.

We have the following changes of address to report: Edwin M. Price, 2415 Yupon Drive, Houston, Texas; Harry P. Sweeny, 19 Green Street, Thomaston, Knox County, Maine. Here's hoping you will all have an enjoyable summer. — H. LESTON CARTER, *Secretary*, 60 Battery-march, Boston 10, Mass.

1909

From Paul: I am all for any "visiting fireman"! Last June at the dinner that Dr. Compton gave for the Honorary Secretaries at the Sheraton, I saw, for what seemed like the first time since graduation, George Gadsby, V, who was one of that noble company who struggled with the spathic iron ore analysis in Bill Hall's lab back in our junior year. I knew that George had been in Pennsylvania at Warren and at Pittsburgh in public utilities, and I knew he had been for many years in Salt Lake City as president and general manager of the Utah Power and Light Company. But seeing George last year was the renewal of a warm friendship. I must admit also that George is an Ohio Buckeye, and I like Ohio and the Buckeyes! You see I went to Ohio for my first job in 1909. Brainerd Dyer and I got employment with the then National Carbon Company and went to work on August 1, 1909. Brainerd was in Course V along with George and me. You'll all remember Brainerd, for his Boston bull, Bob, attended many classes with us at Copley Square, rather to the chagrin of some of the professors. Moreover, I was in Ohio until 1917, and those eight years were among the most profitable I have ever spent. I may have yearned for a sight or a whiff of the ocean when I lived in Fostoria, in the prairies of Seneca County, but now I am glad I saw that bit of the Middle West. In fact, I like to feel that I might qualify as half-a-Buckeye myself, although you'd better not whisper this to a down-right Buckeye like George! He might call me a bit presumptuous! Still, I am pretty sure that one reason I am so fond of George is that he came from Marietta in the Buck-

eye State. Well, the other day I had a note from George saying that he was to be in New York on company matters in April. I looked him up at his hotel and met Evelyn for the first time. George seems much like the old sixpence we knew at Copley Square. He was always good-looking, and he is that indeed now! To be sure, he has done nobly for himself. He showed me a report of his firm, the balance sheet of which showed assets of some eighty-seven and a half millions — no mean record, you'll admit! And there are two sons and three grandsons and one granddaughter. A grand family, if you ask me! Just for the mischief of it, I looked in the Senior Portfolio for George's vital statistics, and there was his birthday, May 4. I am getting this bit ready for The Review on May 1 and had hoped I might give George and Evelyn a little dinner to celebrate the birthday, but they will have left for the West before the Day. One of the things I found out about George is that he has served as chairman of the Community Chest in Salt Lake City, a job that tells what sort of citizen he is. Seeing the Gadsbys makes me toy with the hope that some day I may again see Salt Lake City with them as my guides. I stopped in Salt Lake City for a week end while I was on my way to the West Coast on my circumnavigation in 1919. I had never been that far west before. Everything I saw impressed me favorably. I was unprepared for the wide stretches of what I suppose you'd call desert — bare, dry, and arid soil with high mountains in the distance. But at Salt Lake City I can never forget two things — those brooks, literally brooks of living water, crystal clear, that flowed down the streets along the curbs. And then, of course, I went out to the lake for a swim. I'm no Johnny Weismuller, but I love to swim in my own way. At Salt Lake, however, I could not get my feet under the surface, so buoyant is the water, and my eyes smarted from the high salt content of the water. My swim was not very successful, but I shall always have a delightful memory of a country that fascinated me! And now I am dead sure that the Beehive State profits by having the Gadsbys within its borders.

Recently, a weekly sheet entitled "Calendar of Events" has been coming to me. It announces in some detail future doings on the banks of the Charles. I suppose I get this in my role as class secretary. The current copy covers from April 25 to May 3. I want to share a few items with you all. The sheet is designed for a big bulletin board, since it is 17½ by 11 inches. There are two wide vertical columns of announcements. The top items read, on one column, "Technology Dames," and on the other, "Technology Matrons." We used to know about Cleofan, as undergraduates. I was in Course V, and I knew that Elizabeth Babcock, V, and Helen Fales, whom I saw in the labs, were both members of Cleofan. But maybe the distaff influence is more important in 1947 than it ever was in 1908 or 1909. Might well be, at that! And there are announcements of golf, track, dinghies, lacrosse, and the good old Tech Show, which this year is "A Liberal Life," — I wish I were to be up in Boston to enjoy it. But I'll wager that they'll have no more devastating songs than the one that Ellis

— wasn't he Alexander, III, '08? — sang, part of the chorus running:

"Oh, purr, purr, purr, she was a dreadful blur
Of silk and satin, lace and furbelows
... Oh, purr, purr, purr, why did my poor heart stir
Into such raptures surely no one knows?" ...

Maybe Charlie Belden, II, the best feminine lead I ever saw in any Tech Show, was the heroine and handsome, blond Ellis sang this about "her." I still find myself now and then singing this song to myself, and I remember it pleasantly and vividly too. The Calendar mentions that the Medical Department is offering its facilities in making x-ray examinations of the chest and tells of a photograph exhibition by the Faculty Club and even speaks of a list of approved student tutors that is being compiled! Does not *tempus fugit* still?

Although Johnny Davis, II, is still a partner of the Frank H. Davis Company, recently he has had opportunity to take up art and painting as an avocation, and his house is well decorated with some of his masterpieces, such as paintings of flowers, summer villas, churches, and other scenes. Recently it was announced in the papers that two of his paintings, "The Hubbard House" and "Our Street," had been selected by experts for a special art exhibition held in Robinson Hall, the architectural building at Harvard University.

We are more than pleased to receive from Ben Pepper, I, some firsthand news about Garnett Joslin, III, who recently moved to Mexico City to become a representative of the Towne Securities Company. We quote: "I saw quite an article in the class notes — I think it was for May — about Garnett Joslin going to Mexico City. It may interest you to know that my younger boy, John, my wife, and I drove to Mexico in the first part of April and spent two week ends with the Joslins in Mexico City. Garnett's wife and my wife were close friends in Wellesley, so we had quite a reunion. The last time we saw them was in 1940 in Los Angeles. They seem to be happily established in a very pleasant hotel in Mexico City while they try to find a permanent home. Incidentally, the housing shortage in Mexico City is about as bad as it is here, and the prices, if anything, are worse. We missed Paul Lord, III, I think by a couple of weeks, as I believe he had been in Mexico City just before we were there. Needless to say, it was quite a trip. The drive from the border to Mexico City, then on down to Fortin, is one of the most interesting, and in part one of the most mountainous drives I have ever taken (and I have taken quite a few). I am told that in the 130 miles between Tamazunchale and Zimapan there are 7,300 curves in the road, with various degrees of sharpness. Having driven the road twice, I would not dispute this statement. It is a wonderful piece of engineering."

The Review Secretary, being a Course VI man himself and in close contact with the electrical engineering profession, has little difficulty in learning of the accomplishments of Phil Chase, VI. We have just received the May number of a booklet, "The Announcer," the official bulletin of the Engineers Club of Philadelphia, with a

photograph of Phil as the frontispiece and an announcement that he has been elected president, a high honor. In it were the words of the retiring President Edge, announcing Phil's election, and Phil's modest reply. Phil has been in the utility field for 36 years, ever since he left school, and for the past 19 years he has been chief engineer of the Philadelphia Electric Company. He has been president of the Pennsylvania Electric Association, has been a member and chairman of several A.I.E.E. and E.E.I. committees, has written several technical papers, and has to his credit a number of inventions which are in daily use in the electric field.

Elizabeth, daughter of Reg Jones, VI, received her baccalaureate degree at Wellesley this June. Also, Marian Jones's nephew, Alfred Babcock, received his bachelor's degree at Harvard. Reg, Marian, and the two boys, Reginald, Jr., and Peter, came to Boston to attend both commencements and met many of us local '09 men.

Recently, Bernard M. Baruch, who early in the war started the nation on the life-saving production of synthetic rubber, received a souvenir sample from the 10,000,000th bale of American-made rubber from the world's largest rubber plant. The presentation was made at his Madison Avenue office. In addition, William M. Jeffers and Brad Dewey, X, received similar souvenirs.

We are more than glad to learn of Chet Pope's recent experience in South America and Europe, addressed to Paul, as follows: "I wish to acknowledge receipt of your letter of May 8 and am sorry that you have found it necessary to write me again. . . . I intended to give you this material last September, on my return from a trip to Europe, but was taken ill and confined to my home for most of the fall. I now feel much better and am back at the office about three times a week. The trip was probably a little too strenuous, when you consider it was taken directly after another flying trip to South America. The purpose of these trips was to establish contact with customers whom I had not met or seen, or had orders from, since before the war. I wanted to get some personal experience and knowledge of conditions as they exist in South America and Europe, as soon as possible.

"My South American customers were very glad to see me and wanted to begin doing business immediately and obtain supplies of printing and lithographic inks and varnishes, such as we manufacture. These South American countries realized, as early as 1935, that they had better begin looking toward the United States for their requirements. We always found them friendly and willing to give us some business, but there was always the competition of English, German, French, and Italian goods, which were allowed entry into these countries at more favorable duties than American goods. Probably I should not say 'American' goods, because if you say you are an American in South America, they resent it. They believe that they are Americans, too. You must say that you are a United States citizen, or the simple word 'Yankee' will do.

"The war cut off these foreign sources, and we were able to get some printing supplies to these countries. Since the war and until now, these South American printers

and lithographers have looked solely to us for supplies and are glad that they gave us a good reception when we called on them in the pre-war days. The scarcity of raw materials, such as oils, dyes, bronze powders, and pigment colors, has been the only restriction or limit to their obtaining unlimited supplies from this country. They have been more interested in obtaining supplies than in arguing about price. Price has been no object to these people during the past year. We have had no difficulty at all in procuring our money, on our own terms. The United States still has its South American market, but there are strong indications that Great Britain is doing her best to get some of this trade, especially in machinery. We have no fear, however, as United States manufacturers, of any foreign competition in South America probably for the next four or five years.

"The first thing that was forcibly brought to my personal attention when I arrived in Europe was the scarcity of food. In South America, food was plentiful and good, and at a fairly low price level, but in Europe, even in such countries as Sweden and Switzerland, the opposite was true. As soon as you got off the plane at Malmö, Sweden, you were given a book of food coupons, and you immediately noticed that butter was scarce, and you had to limit your bread consumption. No meat was served, and no *smörgåsarbord*. Eggs and meats were scarce. Fish was plentiful at that time, especially salmon. The principal fruit in Sweden during the month of July was strawberries, and let me tell you they are as good as the best varieties that we have been used to around Boston. The same food conditions existed in Switzerland. We even received meal tickets on arrival. We looked forward to getting cheese in Switzerland and found that this was a very scarce article there. The bread was poor, and meats of all kinds were scarce. The beer was terrible, but the wines were good.

"We found food conditions in Holland much better than in England. During the three weeks that I spent in England, I had very little food. Many times I went out and got two dinners, in order to feel that I had a full ration, or enough to keep me to another meal. All meals in England were limited to five shillings, and it was a scramble to get into those restaurants that served the best meal for five shillings. The Savoy Hotel could give you a little better meal, but there was always an extra two shillings or five shillings for a tablecloth, and so forth. I certainly want to discourage anybody who is fond of eating from taking a pleasure trip to Europe. In England, I honestly felt that every time I had a meal to eat I was taking food from some Briton.

"I found renewal of business excellent in Sweden and Switzerland. Norway, of course, was hit pretty hard, and business is slowly recovering there. They are so much under obligation to Great Britain that it is almost impossible for American merchants to do business in Norway, unless they can obtain British exchange. The same applies to Holland. These countries look on the United States for their supplies, and in all my contacts, customers were very anxious to know how soon and how much goods they could get and never mentioned price. I could go on giving you the story of many experiences that I

had on these trips, but know that space is limited. However, Paul, if you will come out and see us some time, it will make a good opportunity to give you a little more personally."

We regret to announce the death of two more classmates, Dick Ayres, II, and Harold Gardner, II. Dick passed away on October 22 at Louisville, Ky. Dick came to M.I.T. from Pineville, Ky., after graduation was an assistant to the late Professor Charles L. Norton, spent some time with Rice and Hutchins, Inc., of Boston, was in the shoe business in Auburn, Maine, until 1924, when he became superintendent of Plant No. 1 of the United States Shoe Company at Cincinnati. In 1931, he returned to Kentucky and lived at Louisville until his death. While at M.I.T., he was president of the Southern Club and a member of the Class Day Committee.

Harold Gardner passed away on January 22. He came from West Medford, Mass., and our records show that he remained at M.I.T. only two years. He had since been located around Boston, in Lexington, Belmont, Lincoln, and at his death, in Concord, Mass.

This number concludes the year 1946-1947, and your secretaries appreciate the assistance which so many of you have given us in contributing material for the class notes and otherwise co-operating. We wish you all a pleasant summer. — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: Maurice R. Scharff, 285 Madison Avenue, New York 17, N.Y.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

1910

I am sorry to announce the passing of Maurice S. Chapin on May 11. I have no information other than the announcement in the Boston *Herald* of May 14.

Cecil K. Blanchard recently retired from the New Jersey state department of health, where he has served for the past 34 years. Blanchard was well known in the public health service, in that he was editor of "Mark Time," a column appearing for many years in the *Public Health News*, published by the New Jersey department of health, which observes his retirement as follows: "With this issue we bid Godspeed to two loyal health workers who have appeared in the pages of Public Health News for many years — Cecil K. Blanchard, Supervisor of District Health Officers and Sanitation, N. J. State Department of Health, and Mark Time. They — or he, for Mark Time is somewhat of an autobiographical character — retired on January 31, 1947. The New Jersey State Board of Health paid tribute to Cecil K. Blanchard in the following resolution adopted at its regular meeting: WHEREAS, Cecil K. Blanchard, Supervisor of District Health Officers and Sanitation, Bureau of Local Health Administration, has signified his intention of retiring on February 1, 1947, from active duty, and WHEREAS, Mr. Blanchard has served the Department of Health of the State of New Jersey faithfully and well for a period of 34 years in the conduct and development of its public health program, and WHEREAS, The State

Department of Health values the many contributions Mr. Blanchard has made in the furtherance of its local health program and particularly appreciates the unique contribution he has made to its publication, *Public Health News*, in the form of the 'Mark Time' series, therefore be it *Resolved*, That Mr. Blanchard be informed of the Department's regret at his retirement, of its appreciation for his devoted services and as to its desire to extend to him all best wishes for his future happiness and well-being throughout the years of his retirement." — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

1911

Sadly we record the death of one of our brilliant classmates — Harry W. Waterfall, II — who passed away on March 26, after a long siege of Bright's disease, at his home in Baton Rouge, La., where he had been head of the department of mechanical engineering at Louisiana State University. He is survived by his widow, Marie Sinclair Waterfall, to whom our deep sympathy has been expressed.

Harry was born in Boston on June 6, 1887, and while at M.I.T. was active in the Mechanic Arts High School Club and the Mechanical Engineering Society. After graduation he returned to the Institute as an assistant in mechanical engineering and then went into industry as assistant engineer of the William Cramp and Sons Shipbuilding Company of Philadelphia, leaving there to become chief engineer for the Angus Company, Ltd., of Calcutta, India. After several years he returned to New York as executive and mechanical engineer of Kwong Yuen and Company and was a special lecturer at New York University. The educational urge again returned him to that field in 1934, and he was successively instructor and assistant professor at the University of Illinois, associate professor at Johns Hopkins University and finally assistant, associate, and full professor, and head, of the department of mechanical engineering at Louisiana State University. In a memorial prepared by one of Harry's staff members, we read: "Among his professional associates Professor Waterfall was known as an engineer of wide experience and exceptional ability. In his field he was an outstanding scholar. His many friends and acquaintances knew him as a man of high integrity and greatly valued their association with him."

The Grim Reaper finally caught up with our courageous classmate, Ralph Sawyer, XII. Ralph, who had battled so valiantly after his serious injuries resulting from an accident at the Portsmouth Navy Yard, where he had been a civilian employee during the war, died at the Portsmouth Hospital on May 18. You may remember that one of his legs had to be amputated after that Navy Yard accident. Ralph had tried hard to overcome that and other resultant handicaps but finally had to retire from active business. During World War I, he had served in the Field Artillery as a major. He is survived by his wife, Annie Y. Sawyer, 68 Love Lane, Kittery, Maine.

It was fine to have a note from Bob Haslam, X, in late April, announcing that he was back in harness after his illness. From a mutual friend here in Gardner, whom

Bob said he had met and enjoyed golfing with at Pinehurst on his way north from Mexico City, I heard confirmation of the esteem in which we 1911 men hold Bob.

I also have a copy of a fine talk given by Bob last fall at a meeting of the Advertising Club of Washington, now published as a pamphlet, "America's Real Resource," by Standard Oil Company (New Jersey), of which Bob is vice-president in charge of sales. "As soon as the war was over," Bob said in introducing his subject, "I planned and eventually made a trip, which in the past year has taken me to fifteen countries. . . . On these recent trips I was struck more forcibly than ever before by one great difference between our own country and other nations — the difference in the standard of living of the great mass of the people." Listing some of the reasons most frequently advanced by foreigners, Bob maintains that "although size of population and of land may be factors in accounting for our living standard, they are not the answer." Another widespread misconception which he dismisses is the belief abroad that our country has been exceptionally endowed with natural resources, saying that "abundant natural raw materials are no doubt important to a satisfactory standard, but clearly they are not the sole factor."

"It seems to me," concludes Bob, "that the real answer is an intangible, but none the less real, quality of the economic system we have developed. This characteristic is competition — competition of a very special kind. Here in America competition is complete. There is competition at all levels and from all directions. Geographic areas, industries, corporations, new inventions, and people, all compete one with another. . . . American competition not only reaches throughout all levels and cross sections of industry, but it is coupled with a strong tradition of fair play. . . . American competition is tough, but it is not without rules, some unwritten, some law. A further attribute of our system is that it puts a premium upon efficiency, which leads to low prices and high wages, which in turn mean that more people can buy the great quantities of goods we turn out. . . . In all history there has not been any important society in which there was freedom of worship and freedom of speech but not economic freedom. Whether economic liberty grows out of political liberty or the other way around seems beside the point. What is important is that they always exist together." If you would like a copy of this booklet address Esso, Inc., Room 1626, 30 Rockefeller Plaza, New York 20, N.Y.

We haven't heard from Pete White, II, for ages, but Class President Don Stevens, II, recently forwarded me a letter Pete had written, and it's mighty interesting: "You may not know," Pete writes, "that I am no longer connected with the Babcock and Wilcox Company but with the Babcock and Wilcox Tube Company, which is an entirely separate organization engaged in entirely different business from the boiler company. We manufacture tubing of plain carbon steel and all types of alloys that are converted into tubes up to and including the very highest priced stainless alloys. All electric furnace steel is produced in our own steel mill here in Beaver Falls, Pa., the mill having been built by us during the war. It

is a small plant with a capacity of about 6,000 ingot tons a month — our output of seamless tubes ranging from 13 to 17 thousand tons a month. This organization also runs a plant at Alliance, Ohio, where we make electric resistance-welded tubes. In addition, at the main plant at Beaver Falls we make welded stainless tubing. Recently, we have had some minor changes in organization here, and I have been promoted from the position of vice-president and general manager to that of executive vice-president and director on the board of the Tube Company. The job of running the tube company rests on my shoulders and those of our good old mutual friend, Luke Sawyer '10, whom you will remember from the days of yore when he was instructor in the mechanical lab.

"I lately moved from Patterson Heights in Beaver Falls to Sewickley and am now completing what I expect to be the finest flower garden in western Pennsylvania. You may not know that I have become a very famous horticulturist, in fact I soon expect to be made president of all the women's garden clubs of western Pennsylvania. Rosamund, my wife, is bearing up manfully under the strain of being married to the individual who, for a very brief period of time, was referred to as 'the crack half-miler,' a name soon changed by — as well as I can remember — one Stevens to 'the Irish half-cracked miler.'"

"I envy your son, Carver, and your daughter, who live on a farm at Coopers-town, N.Y. Having been brought up on a farm in Ireland to the age of 17, where we raised hay, hell, pigs, chickens, ducks, turkeys, geese, cattle, horses, and sheep, I can say with a great deal of yearning that although farming is a rugged, hard-working undertaking, there are few jobs in life that have more exciting, and I might say almost romantic, occurrences happening continually. This type of life still holds for me the same old glamour it had when I was a boy, and I can spend hours viewing livestock and find it just as interesting as going to a fine exhibition of modern French paintings. Occasionally I bump into our old friend Bunny Wilson, XIV, of the Aluminum Company — always referred to as Chief Wilson. As operating vice-president of Alcoa, his nickname 'Chief' is an appropriate description of his activities. At a meeting of Tech men at the Duquesne Club recently I had quite a chat with Bunny and Zimmie, R. E. Zimmerman, IX, of United States Steel."

Thanks, Don, and I was delighted also to have your fine report on your recent seven-man, two-car trek to the Miramichi for Atlantic salmon fishing. Leaving Ridgewood, N.J., Don and his six mates reported "rain, cold and gale, five degrees, heavy snow, hail, and sleet, chilly, overcast, mud, water over floor boards of cars going out, but 267 fish for our party of seven, including 73 salmon." Don himself did very well, with a catch of 62 fish, including 18 salmon, and the report concludes: "All hands agreed that they had a wonderful time and were enthusiastic about returning for next year on the first opening day after the ice is out, regardless of weather."

And speaking about fishing, in late April, I had a fine letter from Bill Warner, I, in Nowata, Okla., enclosing a picture "of a 1911 fisherman who was lucky

at Acapulco, Mexico, recently — lucky enough to get three marlin, this one being the largest." The marlin in the picture with Bill was a beauty — 10 feet 11 inches long and weighing a little over 300 pounds! "I hooked him underneath," Bill continued, "about two feet back of the mouth and had to pull him in sideways, which was a job. Nearly all the other news is about my sons, one of whom was recently married. He is an English instructor in the University of Colorado. The other is doing rehabilitation work with the veterans at the University of Arizona and plans eventually to go into the cattle business out there. He has a bronze medal for action in World War II."

Having heard recently that former Rear-Admiral de Florez, II, was back in civilian life and operating his De Florez Engineering Company, Inc., at 31 West 47th Street, New York 19, N.Y., I wrote him and suggested he try to get over to M.I.T. for Alumni Day, June 14, and by golly, he wrote back: "I'll do my best. Cheerio and regards!"

In the April 8th issue of the New York *Post* appeared a most interesting interview in the newspaper's daily feature, "Close-up," which carried the caption: "Inventor Never Tears His Hair or Cries Eureka." In the course of her article, the authoress said: "The list of Adm. Luis de Florez' inventions in 'Who's Who' is always incomplete, because between press time and publication date de Florez invariably scurries to the patent office with something new. . . . De Florez now is retired from naval service and heads his own engineering company. He's also a vice-president of the Doubleday Publishing Company, for which he is perfecting a new bookbinding method which he is fairly certain will revolutionize the publishing business. . . . 'I never try to control people,' de Florez says. 'Maybe that's why I became an inventor. I always could control things by inventing them myself.'" Accompanying the article was a fine candid camera shot of Monk with one of his "special devices" that saved so many lives among the young fliers in the recent war, and it had the subtitle: "Little Caesar of the Gadgets is Adm. Luis de Florez."

On May 16, a powerful fleet of 101 Superfortress bombers winged over key eastern seaboard cities on a simulated combat mission, the first rendezvous of the two air forces which make up the strategic air command, and you've guessed by now who led the formation — our own General Kenney, I, commander of the Army Air Forces Strategic Command. Another 30 of the bombers were diverted to MacDill Field, Tampa, Fla., by "very bad weather," which caused George to remark at a luncheon tendered him by city leaders in New York City: "They did pretty well, but we could improve on the show." Later, however, in a broadcast from New York he said that "even though this force looked formidable to us today, it wouldn't last long in a shooting war. You see, during the war, when we could dispatch five times as many B-29's as you saw today, we had the factories turning out nine more every day. That took care of the combat losses. Now that reserve of factory production is not with us, and we have no stockpile of B-29's or trained crews to back up

the force you saw today." Two days later, in an "I'm An American Day" speech, George pleaded for an air force second to none for the U.S.A. A bit earlier, a letter from Selly Seligman, III, gave me an item his wife's sister had clipped from a Bangor paper, telling of George inspecting the huge new airfield, one of four capable of handling the new B-36's, in Limestone, Maine.

From my faithful correspondent, Ottillie (Mrs. Paul A.) Cushman, Valparaiso, Ind., comes a letter enclosing announcement of a talk on "Science" made by Marcus A. Grossman, III, director of research for the Carnegie-Illinois Steel Corporation in Chicago, at a dinner meeting of the Chicago chapter of the American Society for Metals, on May 8. She added with pride that Paul is listed in "Who's Who in the Central States," a recent new publication, and, continuing his activity in Masonic circles, was recently elected patron of the Valparaiso Eastern Star and is also high priest this year in the Valparaiso chapter of Royal Arch Masons; last fall he was re-elected registrar of the Society of Descendants of Isaac Allerton of the *Mayflower*.

Thanks to Cac Clarke, 1921's active Secretary, I recently received "another side light on Bill Orchard, XI, the man who is always news and always in the news" in the form of a clipping from the May 12th Newark *News* showing a sample ballot for the forthcoming Constitutional Convention in New Jersey. Essex County, wherein Bill resides in Maplewood, is entitled to 13 votes, and Bill is one of the 13 candidates of the "Clean Government" Republican slate. We hope you win, Bill!

Not long ago, we met Frank Parker '36, oldest son of our late classmate, Ted Parker, I, at an industrial conference in Boston. He is married and now has four children and said that his younger sister was married lately. Their mother, he added, still lives in Wellesley. I also saw Tom Haines, II, and Jack Herlihy, II, that day at the conference.

A recent card from Ted van Tassel, X, mailed from Chicago on May 13, said that he and Helen had had breakfast with Lloyd and Treva Cooley. He added that he and his wife were en route for Vancouver, B.C., by train and hoped to get back for Alumni Day but rather doubted it. — Johnny Bigelow, IV, has been re-elected secretary of the Marlboro, Mass., Rotary Club; while in near-by Leominster, Harold Shaw, II, was elected to the board of directors of the Rotary Club there. — A. T. Cushing, I, who during the war years was with the War Food Administration, is now back with the Department of Agriculture, with offices in Room 715, Temple Building, Kansas City, Mo.

Hello, here's a note from Emmons Whitcomb, X, the original Raymond and Whitcomb travel kid: "A bit of news for you! I am leaving the Institute and getting back into the travel business. I am very enthusiastic about it for I feel that the next four or five years are going to be great years for everyone in the travel business. Will you be good enough to make a record of where I am and when you hear of any of your friends who want to travel, send them along? The location is at the corner of Arlington Street, opposite Schrafft's — drop

in and see what a nice setup I have here!" I'm sure every one of us is delighted to hear that Whit is back at his original calling, travel, and wishes him all success therein.

Well, mates, once again we're off to a good start in Alumni Fund VIII, for in the first month (April) subscriptions from 1911 amounted to \$1,288.50 from 64 regular, and two life, members, an average of \$19.42 as against \$1,184 in April, 1946, from 60 regular and three life members for an \$18.80 average. Let's keep rolling in high gear!

So ends another volume of 1911 notes without an issue missed, and here's best wishes to all of you for a fine summer. Don't forget that your vacation trip will give you something to write about, so jot it down on your calendar pad, for some convenient date in early September, to be sure to "Write to Dennie." — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1913

With almost all the expected returns in, it looks as if the Class prefers, by a two to one vote, to hold our 35th in Boston, rather than at a near-by resort. It is a long time since we have heard from William Guild, XI, who writes: "I am actively in the real-estate business and half owner of Carley Realty in Newton, Mass., and founder and half owner of the Transferred Executives Guild, an organization of co-operating real-estate men who give service in every city in the United States with a population of 50,000 or more. We assist in locating a home in the city of destination and dispose of the home which is left behind — and do it on a synchronous basis so that the uncertainty is removed and the old one is sold and the new one bought on the same market price level." This Transferred Executives Guild looks like a good idea, and my thought is that it might help considerably in saving taxes.

We had few more colorful men with us at the Institute than Lammie Lemaire, III, and it is a pleasure to print his recent letter: "No news reaching me of late gave more pleasure than the above advice from your good old self, and I must immediately answer your first query by casting my rendezvous vote in favor of Melbourne, Australia. Would that you could all meet here and give me a chance to do you proudly! Yours is the first class missive I have received for many years, probably because of my absence since 1940 on service in the Middle East and Pacific arenas until last year. During the war years I had the privilege of meeting Dr. Compton, being released from hospital for the special occasion of breakfasting with him. Alden Waitt '14 and I also met and exchanged notes; and he has been kind enough to write me several bulletins of his movements since taking over the very responsible and onerous job of being chief of Chemical Warfare. I had the good luck to serve on the Commander-in-Chief's staff throughout the war and ended as brigadier, Chief Inspector, Army, a most interesting and absorbing job, consisting, if anything, of efficiency engineering. My two sons served throughout most of the war in the army

and navy respectively, and my daughter, who is a bachelor of engineering science, and bachelor of mechanical engineering, the only woman graduate out here, did her bit in research work. As my wife gave up her time to social welfare, I don't think this Australian family let down the Allies' effort. After 18 months in hospital and in convalescence following on evacuation from Bougainville the night before the Armistice, my health is nearly restored, and having been discharged from the army, and placed on reserve, I am now in process of getting ready to go to my upcountry ranch, looking after my cattle and sheep and catching a few trout, I hope. This seems a very egotistical script, but you asked for news, so here it is. Please forgive the typing done personally on a little portable, my hands not yet being fit for letter-writing. My greetings to all the Class of 1913, long may they prosper and keep the torch burning; and particularly good wishes to your dear old self and Bill Mattson."

J. B. MacNeill, VI, has achievements which were recognized in the 1946 Award of the Lamme Medal of the American Institute of Electrical Engineers, "for his foresight, leadership, and creative contribution in the development of switching equipment." J. B. writes as follows: "Your note of February 11 is an invitation to write you which this time I will not overlook. I entered M.I.T. with the Class of 1914 but came out with the Class of 1913 by virtue of some outside credits and considerable hard work. Therefore, I have never felt myself to be altogether a Class of 1913 man and have been diffident about contributing to your interesting memoranda. You have heard of the old gentleman who died in Marblehead at the age of 97. The town paper, in writing up his death stated, 'He, however, was not a real Marbleheader as he was brought here at the age of seven by his parents.' I feel somewhat this way when in the presence of '13 members, that is, of those who were '13 all the way through. Occasionally, I visit Cambridge in the capacity of a Westinghouse university visitor and in so doing see Joe MacKinnon and others. Right now in the graduating class there, we have a son named Paul Gordon, who is living on Memorial Drive just outside the campus, and he in turn has just been presented with a Paul Gordon, Jr. So far, this member of the third generation has not indicated a preference for M.I.T., but his ideas in other directions seem very positive.

"I am still located at East Pittsburgh as manager of the switchgear and control division for Westinghouse Electric and would like to attend your 35th anniversary in June, 1948, regardless of location. The 100 per-cent '13 boys are entitled to pick the spot. Attached is a little publicity notice on the Lamme Medal for 1946, of which I shall be the happy recipient. Since I knew Mr. Lamme years ago when he was chief engineer of the Westinghouse Company, you can readily imagine that the medal bearing his name and given annually by the American Institute of Electrical Engineers has a great deal of significance for me."

The following biographical sketch was written by H. H. Henline, Secretary of the American Institute of Electrical Engineers:

"John B. MacNeill, manager of the switchgear and control division of the Westinghouse Electric Corporation, was born in Summerside, Prince Edward Island, Canada, on June 21, 1888. He attended grammar school in Boston, Mass., and the Mechanic Arts High School, Boston. Mr. MacNeill then attended Lowell Institute from 1906-1908, and on March 15, 1909, entered the employ of Westinghouse as a draftsman. He left the company in 1910 and entered . . . Technology, where he was graduated in 1913 with the degree of bachelor of science in electrical engineering. On July 1, 1913, he re-entered the employ of Westinghouse and has been with the company continuously since that date. Mr. MacNeill has 30 issued patents and a considerable number now pending covering modern electrical switching equipment. Five important developments in the switchgear field were under Mr. MacNeill's supervision. . . . From 1943 to 1945, he headed the Westinghouse effort on process equipment manufactured for the United States Army, Manhattan District Atomic Bomb Project. This equipment first produced fissionable material in usable quantities. He observed the underwater test at Bikini in July, 1946, as special representative of the Manhattan Project. Mr. MacNeill supervises the switchgear division at East Pittsburgh, the porcelain plant at Derry, and the newly acquired plant for standard control at Beaver. In 1938, he was given the Westinghouse Order of Merit, the highest award the company presents to employees who have performed outstanding work in the electrical industry and its associated crafts. His Order of Merit citation read: 'For his creative ability in the advancement of the art of circuit interruption; for ingenuity in design and development which has enhanced the company's reputation both at home and abroad; and for his executive ability in supervising the engineering work on the widely diversified lines of products in the switchgear division.'"

I ran across George Starr, I, during last March in Greenville, S.C. George is general superintendent of John Hession's Preload Corporation, and his work takes him all over the country. We spent a pleasant hour or two talking over the foibles of Course I men as we knew them at Technology. — John Hession, I, I hear, has prospered, and justly so. He writes: "Each year when I get the notice from you on class dues, I cannot help but think what you mean to 1913 for the way you have stood by the work of secretary and all that goes with it. That devotion to the class rates you in my mind as more than secretary; I think you are the class hero, if you don't mind. My check for the dollar dues is attached. My preference as between the Cape and Boston for our 35th Anniversary in June, 1948, would be Boston. As for news about myself, there isn't too much. I see Gene MacDonald, I suppose, once or twice a year, and had lunch with him a month or so back. Gene being a top bridgebuilder and I being with the Preload Corporation, which specializes in prestressed concrete, a relatively new art to Americans, though not to Europeans — some day the combination might produce the first prestressed concrete girder bridge on this side of the water. Time will tell. Over the years I have kept in contact with M.I.T. largely

through experimental work it did for my companies on prestressed concrete and water-proofing, and much data of mutual value has been obtained. More recently, I have been put on the Visiting Committee of the Department of Building Engineering and Construction at the Institute. This, you know, is Course XVII, which long since has been split away from Course I (Civil Engineering) and Course IV (Architecture). I find XVII a *live* course in capable hands. Maybe that word 'live' is inspired from our 1913 Class, which always considered itself the live class. At any rate, both our Class and Course XVII are really good, if you want to take the opinion of a biased Tech man."

Marion Rice Hart, X, has gone from sailboats to aeroplanes. She learned to fly last summer, and last winter she was having fun with her new Cessna 140, which, I am told, is a real aeroplane. — Ed Hurst, II, comes across, as usual with something to laugh about: "Thanks for your note of February 11, and it is a pleasure to enclose the check for class dues. You are a fine expense control man, and it is too bad for all of us taxpayers that you are not in charge of the national budget. Now regarding the 35th anniversary in June, 1948, so far as I am concerned, the whereabouts of the reunion makes no difference. I think it should be held at a place which will tend to assure maximum attendance of our classmates. For my part, geography is secondary to sentiment. To my personal knowledge, you have a lot more on your side in addition to Bill Mattson and Bill Ready. I saw Bill Mattson last Saturday in Newtonville. He was very much upset. It seems that a cat had crawled into one of his lockers and had delivered kittens therein. Bill was being sued by the Society for Prevention of Cruelty to Dumb Animals for not supplying padding on the floors of his lockers. Thus, you see, the vicissitudes of this terrestrial sojourn are a mathematical function of the increase of living things."

Although Gardner Alden, X, is outvoted on his idea to keep our reunion mates away from temptations, he says: "This is a somewhat belated acknowledgment of your February 11th notice. Here are two dollars. I suspect that I defaulted in 1946. Perhaps this will put me back on a pay-as-you-go basis. I am glad to be reminded that the Class will celebrate its 35th anniversary in June, 1948 — or am I? At any rate, as long as the passage of time brings us to this venerable point in our history, I vote to take the Class away from the temptations of Greater Boston — big city that is — for the celebration of its 35th anniversary. You will understand that I am not opposed to the conveying of a few well-chosen temptations to the beach, the mountains, or other rural site selected for the occasion. The Cape sounds satisfactory — it might well have a popular appeal. There's not much to say about myself that would qualify as news. I am still in research work with the Dennison Manufacturing Company, in Framingham, after 26 years. Gardner, Jr., was M.I.T., 1944, Course X-B, Ruth was Simmons, 1937, and Priscilla was Simmons, 1942. Also, we seem to be acquiring some extra fine grandchildren; but I don't believe that I'll go into that here. Grandma and Grandpa spend their time puttering around the old home-

stead. Once in a while I run across a former classmate but not often. Last December in New York, I had a nice chat with John Coe, whom I hadn't seen since our 25th in Boston."

Ed Bridge, IV, has resigned his professorship at Technology to open his own office on State Street, Boston, with his son Richard H. (M.I.T. '42). He is very busy with architectural commissions both public and private, churches, commercial buildings, and houses. — René Richard, I, died suddenly on April 18, in his 60th year. He took his bachelor's degree with us in 1913 and was employed by Charles T. Main, Inc., as a civil engineer; he had previously been with Stone and Webster. — As a side line to his architectural office, in Providence, specializing in schools and churches, Fred Kennedy, IV, is operating a poultry ranch, with 7,000 hens. It sounds like a considerable chore, suggesting that Fred must have exceptional energy. — Jack Horsch, XIV, writes, from Woodbury, N.J., as follows: "My chief personal news is that Gertrude and I became grandparents for the first time last October 15, when a fine son was born to our older daughter (New Jersey College for Women, 1940) and her husband (who is a Tufts graduate, working for Du Pont). Our other daughter is a junior at Colby College. We maintain fairly frequent contact (for these busy times) with two other classmates, Millard Merrill and Bob Weeks, both of whom are very active and doing a good job in their respective fields." Bob Weeks, VI, is very busy, erecting radio and television towers, over the eastern states. He flew to Florida last winter to inspect some installations of his equipment.

H. E. Crawford, IV, writes from Walla Walla, Wash., that he wishes T. S. Byrne, and all the old Option 2 gang in Course IV would go to the state of Washington, with all their grandchildren, for a reunion. — Sam Rogers, II, has retired from the insurance business and bought a permanent home in Florida, "Anchors Aweigh," Siesta Key, Sarasota. Nice going, Sam, we hope you will tell us all about it at the reunion next June. — From Mrs. Lee Bowman, we hear, without his knowing of it, that Lee, IV, has a wife, daughter of 14, and a cat. He worries about such things as strikes, has no time for travel, has plenty of experience in drafting and teaching, plays billiards regularly, and bowls occasionally. Thank you, Mrs. Bowman; it would be nice if wives of our other reticent mates would copy you. — Rusty Sage, I, reports all five children married. His brood has deserted the family home, and for the first time since 1914, there are no children around the house. — Joe Cohen, X, can hardly believe that 1948 is our 35th anniversary year, but admits that the calendar tells no lies. He is going to make every effort to attend and will be glad to be helpful in any way. Joe is the helpful kind, witness June, 1938.

From Arizona, our ebullient Sam Knight, VI, has this to say: "The prospect of my reaching the 35th looks so slim from where I'm sitting that it would seem presumptuous to express any preference. I should like mighty well to see the effect of the two Bills on the party at any time, any place. There is no news; costs are a little higher, scratch a little harder, but I'm still smiling and thus confident I could still stow away

as many steamed clams and as much broiled live lobster, with all the trimmings, as any '13 man, including Dave Nason. Speaking of Dave, it seems to me that I read in *The Review* some time ago an appeal for a handout in the form of a modicum of that delicious beverage originating in the state of Kentucky. I was unable to do anything about it, but my heart has been bleeding for Dave ever since. If you happen to hear that he is still suffering, please send him word that I have it on good authority that there is a plentiful supply in San Francisco."

I can't imagine that Bill Brewster, II, would ever tire, but his letter of last February, hints at something of the kind: "You certainly are forehanded with respect to our 35th — of course, you are forehanded about everything. Thirty-five sounds like a lot of years, doesn't it, and I am beginning to think it is quite a lot of years and that at least the last of them have been years of decision. I don't have any very startling news about myself. All my activities have been concerned with the business, practically, and there have been plenty of them. We have recently taken over a cordage company which was operating in New Orleans and now have a mill in that fair city. For a little change and rest, I am off in a week or so, I hope, for Central America to have a look at the abacá plantations (Mannila hemp to you) which the United Fruit Company have there."

J. B. Woodward, Jr., II, became, last summer, president and general manager of the Newport News Shipbuilding and Dry Dock Company. John has risen to the top in 32 years of sticking to one job, and he employs a dozen or so Tech men, nearly all of long service and in jobs of importance. — George Dempsey, X, is still making "Crossett Shoes for Men" in Dover, N.H. During the war he served on W.P.B. and O.P.A. boards in Washington. — Edgar Menderson, II, is still executive secretary of the Security Savings and Loan Company, in Cincinnati. He has made a lot of G.I. loans, and expects to make a lot more this year and next. — George Richter, X, was recently married, and was planning last February to take a month's trip to Nassau and Haiti. — Earle Caldwell, X, has resigned from the Florence, Mass., Casket Company, after 27 years of service, to take life easier and go into business for himself, thereby getting rid of all the factory headaches. Earle will be a jobber and manufacturer's representative. He wants George Forrester to attend the reunion, and we will work on George to that end. — George Cahill has been for the last 10 years state director of the Massachusetts office of the Federal Housing Administration. George brought a good background to that job, having previously spent a number of years in the construction and mortgage lending business. — Fred Blackwood, VI, plans to be with us in June, 1948. He is busy with the Associated Factory Mutual Fire Insurance Companies, and has raised three girls. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 788, Pawtucket, R.I.

1914

Ernest Crocker manages to continue to make the headlines in the local papers. His latest achievement is that of becoming

chairman-elect of the northeastern section of the American Chemical Society. Crocker also delivered a paper on flavors and tastes before a group of extract manufacturers at Atlantic City in the latter part of May. Perhaps it is because of his many activities that he was recently laid up for more than a month, but Crocker assures your Secretary that he is now feeling quite well again.

Mr. and Mrs. F. Perry Close of Madison, Conn., have announced the engagement of their daughter, Virginia, to David Chase Peaslee, son of our classmate, Art Peaslee. David has been taking graduate work at M.I.T. and is a candidate for the doctorate in physics.

Your Secretary recently made a somewhat extended trip, including a stop at Atlantic City to take over the chairmanship of the Scientific Apparatus Makers of America. One of the stops on this trip was at Schenectady, N.Y., where he had expected to see Phil Currier, who has been with the General Electric Company since graduation. Unfortunately, he found that Phil had been ill for quite some time and was confined to his home. Your Secretary talked with Phil, and Phil expressed an interest in hearing from any '14 men who might care to drop him a note. His address is 38 East High Street, Ballston Spa, N.Y.

Shortly after leaving Atlantic City, your Secretary noted an article in the *New York Times* quoting from an address made at Atlantic City by George Whitwell very soon after your Secretary had been there. George was speaking before the National Electrical Wholesalers Association and was discussing a program pertaining to the sale of electrical appliances. He was quoted as saying that in order to have price reduction it would be necessary to have greater productivity per man-hour. He predicted, however, that if the present spiraling cycle could be stopped, five years of good business were in sight. He also took a good dig at the type of advertising usually associated with electrical appliances, stating that it was in the "nut and bolt" stage and that "there is a lot of glamour in the electrical business which we should emphasize, but we usually miss the boat in our advertising." Probably most of his classmates are well aware of the fact that George's sales promotion program for the Philadelphia Electric Company is considered one of the very best in the entire country and that George is frequently quoted as an outstanding authority in this field. — H. B. RICHMOND, *Secretary*, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York 19, N.Y.

1915

Either you have received, or you will receive soon, my letter on the Alumni Fund. Read and heed and send your check for just a little more than last year and put old 1915 back in the 100-per-cent bracket.

Class congratulations to another class daughter. Johnnie O'Brien's daughter, Loretta Jane, was married to George A. Collins, Jr., on June 7 at St. Joseph's Church, Medford, Mass. You should have seen old Johnnie looking his best going down that aisle!

We hope to have a Boston class dinner early in the fall to plan for our 35th anniversary in 1950. How time marches on!

The first Review issue in the fall will carry the full story of classmates who attend the Alumni Banquet on June 14 . . . also the story of the week end Frances and I will spend with Charlie and Bee Norton at Charlie's place on Martha's Vineyard. He has given up sheep raising to return to building and engineering.

At the Stevens Institute of Technology, Hoboken, N.J., on June 4, Larry Bailey of the F. J. Stokes Machine Company in Philadelphia, gave the Third Annual Medal Lecture sponsored by the Powder Metallurgy Laboratory. Larry received this medal award for outstanding achievement in the field of powder metallurgy.

In Detroit last May, Frances and I unfortunately missed Loring Hall, but in Buffalo we had lunch with Ben and Sophie Lapp. It was our first contact with Ben in many years. He hasn't changed much from his appearance in the 1915 Relay Team picture he proudly has on the wall. He's a grandfather and has a son, Marshall, a high school freshman, who hopes to enter Technology later. Fran and I spent the evening with the Hiltons and Neals. You've read many times in these notes of my good times in Buffalo with them. On this, Fran's first trip, their hospitality knew no limits. We stayed at the Neals' in Lockport, and when we came to, the next noon, reluctantly left for the East. In Boston, Gene and Ruth Place were entertaining Peggy Neal one week end, and on their way to return her to Pine Manor in Wellesley, they all stopped in to see us for a pleasant evening.

If any of you come to Boston this summer, be sure to telephone me at LONGwood 3438. A good summer to you all, and help the Alumni Fund, which will "help Azel." — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

1916

Summer inertia is reflected in the amount of material your Secretaries have not received. Delving into their store, however, they came up with the following interesting accounts from members of the Class.

Willard Brown goes on record with this report: "During the years of war preparation, I was in charge of a number of lighting activities for General Electric, the most important being industrial lighting. Our engineers pioneered and developed the continuous-row system of fluorescent lighting which became the accepted standard for our large war plants. In 1941-1942, I was president of the Illuminating Engineering Society, and marshaled the resources of that group to aid in the war effort in the way of lighting developments and techniques. As soon as my term was completed in the fall of 1942, I was called to active duty with the Navy in my rank of commander, U.S.N.R., in the Supply Corps.

"For two and a half years, I was officer in charge of the commodity purchase division of the Bureau of Supplies and Accounts in the Navy Department. In this capacity I recruited, trained, and directed most of the 150 officers of this division, each a business man of long experience and high standing in his industry, the group representing a very great variety of important industries. They procured the general supplies for the Navy, including fuel and clothing and many thousand other items, finding ade-

quate suppliers and negotiating contracts to a total in excess of seven billion dollars. In March, 1945, I was promoted to the rank of captain and became officer in charge of the Navy Purchasing Office in Chicago, one of the four principal field procurement offices of the Navy. At the end of the war, I returned to the lamp department of the General Electric Company as executive engineer and assistant to the director of engineering, at its Nela Park headquarters."

A concise report from Leonard Best follows: "My professional career shows a periodic vibration that must mean something, but I'm not quite sure what! 1916-1924: development engineer, Hood Rubber Company, Watertown, Mass.; 1924-1928: executive, Richard Best Pencil Company, Irvington, N.J.; 1929-1935: development engineer, United States Rubber Company, Passaic, N.J.; 1935-1940: executive, Richard Best Pencil Company, Irvington, N.J.; 1940-1945: development engineer, United States Rubber Company, Passaic, N.J.; 1945 — executive, Richard Best Pencil Company, Springfield, N.J." Dare we suggest that here is a career with a point to it? Leonard goes on to say that his hobbies are "municipal government, the Summit board of education (of which he is a member), the Summit Council of Churches (of which he is president); Rotary, and the vestry of Calvary Episcopal Church in Summit, N.J. (in which he is active).

Earl Townsend contributes the following: "After M.I.T., I went with the Massachusetts highway commission as surveyor and resident engineer throughout the state and engaged in this work until 1918. From 1918-1940, I was with the National Appraisal Company of Boston and other principal cities of the United States and Canada. I served in all departments — operating, selling, and executive, becoming general manager in 1925 and serving in that capacity until 1940. In 1940, I joined the appraisal division of the Associated Factory Mutual Fire Insurance Companies at Boston as appraiser of large industrial properties insured by the companies. The work is interesting and varied, and our activities extend from coast to coast in both the United States and Canada. Our department makes inspections, appraisals, and adjustments for the several fire insurance companies. It performs other service functions, such as the examination and approval of water supply systems, fire prevention equipment, and electrical and mechanical apparatus used in industry. I am in frequent contact with plant managers and engineers and often meet M.I.T. men in these positions. I am always impressed with the high quality of work performed by the men from the Institute, and although I feel humble about my own attainments, it seems to me a privilege to be a member of such a group. I read a lot, play some golf, collect stamps, 'fix' things at home, and interest myself in the activities of a family of four, the first of whom was born in 1916. My current interest is my four-year-old granddaughter. I have traveled in most of the states of this country and the Canadian provinces and should like to visit at least two more continents before our 50th reunion."

A letter from Dr. John Bradley to our Class Historian reads as follows: "I served as a major in the Medical Reserve Corps during World War I. After finishing my

internship at Bellevue Hospital, I went directly into the Army as a first lieutenant and served in the United States and the Philippines, visiting China, Japan, and many of the islands in the South Pacific, including Borneo, where I saw the Wild Man from Borneo — a sight I had wanted to see since I was a small boy of ten. I practiced medicine in the same office in Rochester, N.Y., for 30 years and retired on April 1, 1946, to live in Spencerport, N.Y."

Theron Curtis is vice-president in charge of property management for the Industrial Trust Company, and he sent this account: "Like most industries from 1941 to the present time, we have had our share of difficulties with wartime shortages, restrictions, and so on. In 1941, we built a summer home down on the south shore of Cape Cod near Falmouth, not very far from East Bay Lodge, where our 30th was held. We spend most of our spare moments at this beautiful spot, where boating, fishing, and swimming, are, we think, about the finest in the world. Most week ends of the year find us down there so that we feel almost as much residents of Cape Cod as of Providence, R.I."

The unusual comes from Saul Hoffman: "My pleasurable pastime has been the study of the occult under a Hindu Brahman for over 15 years. I have also delved into the study of the Sanskrit language and the advanced basis of all religions. I have done the breathing exercises, meditations, concentrations, and so forth. I have been a strict vegetarian for seven years and have enjoyed every moment of it. During World War II, I did some research work at the Kropp Forge Company in Chicago. They made parts for airplanes, machine guns, invasion barges and landing ships for tanks.

"I am back again in the textile field with the same firm, namely, N. Fluegelman and Company, as their Central West sales manager for the past 23 years. I have two sons in high school, both getting top grades of Sigma throughout all their courses. The older boy is 15 years of age and will be graduated next year. He has already applied for admission to M.I.T. His hobby is building and flying model airplanes; he is also taking flying lessons and expects to get his pilot's license next year, when he reaches the required age of 16. The younger boy is 13 years of age and has made an extensive hobby of stamp collecting. He has friends who correspond with him regularly from more than half a dozen European and Asiatic countries. The next is a surprise and one for the books. I have a beautiful daughter, two years old on May 9, and she is a dream. I guess I'll have to make a prima donna out of her. I must not forget to mention my wife, who is a talented pianist and a beauty. She is 15 years younger than I. That's enough, brother . . . now let's have no more."

A clipping from the *Dorchester Beacon* tells us that William J. Barrett has been appointed vice-president in charge of publications by the Metropolitan Life Insurance Company at the home office of the company in New York. "Barrett," the announcement reads, "has been identified with that company for the past twenty years, serving all his time in the New York office, where he rose from a position

of mediocrity to his present exalted position. He lives in Darien, Conn., with one son, Billy, aged 7. Mrs. Barrett died two years ago.

A long report from the *Boston News Bureau* concerning the activities of the Sound Scriber Corporation reveals that "the man who visualized the possibilities of developing an office machine from Thompson's recording device was Herbert Gfroerer." Herb is now chairman and executive vice-president of the company. Sound Scriber, according to the Department of Commerce figures as of July, 1946, was reported to be doing about 30 per cent of the national business in the sound dictating machine field.

Our author, Russell Hubbard White, is enjoying considerable fame as a Biblical authority. He stopped in a few weeks ago to report that later in the season he is planning a trip West to give lectures on his combined gospels. Perhaps many of you have seen the displays of Rusty's widely read book in Boston bookshop windows.

Your Secretary is pleased and proud to report that his second son, Hasbrouck, who finished at St. Mark's School this year, has been accepted at Technology. Perhaps there are other sons of 1916 entering this fall; drop us a line and let us know. We enjoy hearing of these father-son combinations. During the summer months don't forget to keep us posted — we want an exceptional issue for the fall. — RALPH A. FLETCHER, *Secretary*, P.O. Box 71, West Chelmsford, Mass. HAROLD F. DODGE, *Assistant Secretary*, Bell Telephone Laboratories, 463 West Street, New York 14, N.Y.

1917

We have a gracious note from our new Ambassador to Great Britain. Lew Douglas will not be able to join the reunion in June as several matters call for his action elsewhere, but he has written in his appreciation of our congratulatory good wishes.

A heading on the *Boston Herald* for April 9, stated "Home for Aged Couples Elects Lucius T. Hill." We were rather relieved to find on careful examination that this did not mean that he was retiring from his work with the housing project of the John Hancock Mutual Life Insurance Company and his other business activities. He was elected president of the home at their annual corporation meeting, succeeding Hermann F. Clarke, who had served for the previous 14 years.

The Framingham *News* for January 22 contained the following item: "Ralph H. Sawyer . . . announced his candidacy for the school committee. Mr. Sawyer, in charge of manufacturing at the Lombard Governor Corporation, is a native of Framingham, the son of the late H. L. Sawyer, and for 20 years was head of the H. L. Sawyer Hardware Co. here. He is a graduate of Framingham High and . . . of Technology, where he received the S.B. degree in Mechanical Engineering. . . ."

Victor Dolmage has been engaged as consulting geologist by Dentonia Mines, Ltd., near Greenwood, British Columbia.

George W. Burpee has announced the appointment of David E. Pierce as chief engineer of the General Aniline and Film Corporation. Mr. Pierce has for five years

been chief engineer of the General Aniline Works division of the company which manufactures dyestuffs, intermediates, detergents, and textile auxiliaries. As chief engineer of the corporation, his work will embrace all divisions, including the Ansco film and camera division at Binghamton, N.Y., and the Ozalid machine and sensitized materials division at Johnson City, N.Y. A substantial construction program to provide increased facilities is in progress in all divisions.

Clarence Holt returned from his annual winter pilgrimage to Florida and reported that he had talked with Max J. Mackler, executive director of the housing authority of the city of Tampa, and with John McCormick, a lieutenant colonel in the Army Medical Department, who is living in St. Petersburg. He spoke to both of them about the reunion, and although Mackler thought it possible that he might be on hand, McCormick was planning to move at the time of the reunion and will have to defer his New England visit to Alumni Day. — RAYMOND STEVENS, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1918

Engineers are an extroverted lot, sketching their achievements on paper in order to think a problem through to the end before even starting to produce a result. But these thoughts have to do with things, not with what life is all about or why we are here. Architects are a different sort. They, too, sketch their achievements on paper; they, too, try to think a creative piece of work through to the end before the foundation is dug; and in addition they think out a philosophy, believing that any sort of structure is weak unless it expresses a theory of life, a function of living, an emotional mood. So one has the right to wonder whether Victor Leonard Simon Hafner ever contemplated the design of a chicken coop, or a dog house, or a racing stable, or even a cow barn, with a question in his mind as to whether man is the only animal who lives out his days in full consciousness of the inescapability of his being mortal. Does the young forest creature, peering bright-eyed from behind some flourishing bush, realize that not merely the paths of glory but all paths "lead but to the grave"?

Hafner had his moments of glory. He won the Rotch Traveling Scholarship in 1920 and the Grand Prix de Rome in Architecture in 1921. He served in the Navy in World War II, having been discharged in 1946 with the rank of commander. He had an architectural office at 101 Park Avenue, New York, and a home at 99 North Broadway, Irvington, N.Y. Now he has found a more mysterious home. He died on April 26. — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

The Class held a dinner in New York at the Winthrop Hotel on Tuesday, April 22, in honor of our classmate, K. T. Lee, XV, who was here for a visit after having been in Shanghai, China, for the past 28 years since graduation. K. T. is general manager of the China Chemical Works, Ltd., 257

Honan Road, Shanghai. His stories about China and his experiences, particularly during the war years, were exceedingly interesting, and the group shared in a very informative discussion on this and other subjects. Buzz deLima told some of his experiences with the Navy in mines use and development and countermeasures in the European and Pacific war theaters. Albert Reynolds, Fred Given, Jacob Braverman, Karl Rodgers, Leo Kelley, Jim Strobridge, Don Way, and Gene Smoley were present and made some headway in formulation of plans for our 30-year reunion. Announcements and developments will follow in the course of the next year. Regrets were received from Alex Wiren, M. A. Michaels, Mrs. C. L. Higgins, F. T. Smith, and Ralph Gilbert.

Jim Strobridge is back in New York again as vice-president of the Strobridge Lithographing Company, in charge of the New York office at 250 Park Avenue. — Ed Scofield dropped a line to say that his family weathered 1946 and hope to do the same in 1947. He was in New York in February, but limited time kept him from getting in touch with us. — Henry Weymouth writes, "I am still with the Maine state highway commission, and nothing newsworthy ever happens to me. I'm looking forward to the reunion in June."

Francis A. Weiskittel, 2933 North Charles Street, Baltimore, Md., announces the birth on December 30 of his second son, named Sturtevant Ford Weiskittel. He writes, "I'm getting along in age, naturally, but considering that I was not married until August, 1944, I feel greatly blessed with our boys." — Arthur H. Blake writes, "I finally got out of the Army about a year ago and have been with Stone and Webster in Boston for about six months. I lunched with Art Kenison last week but haven't seen any other 1919 men recently." — Frederick G. C. Smith of Holyoke, Mass., comments, "No change in status. I am married and have three children — a girl, 13, and two boys, 11 and 8. I am vice-president-treasurer of the Holyoke Valve and Hydrant Company. I haven't seen a member of the Class for a long, long time." — Arthur E. Wales dropped a line to say hello but no news.

The following changes of address have been received: Lieutenant Colonel Bassett is transferred from Louisiana, Mo., to the Alabama Ordnance Works, Sylacauga, Ala. Arthur R. Ford has moved from Lansdowne, Pa., to 35 James Road, Hattboro, Pa. Gee C. Liu's address is 38 Sin Wu Street, Tai Nam Road, Canton, China. Albert Mayer is back with Mayer and Whittlesey, 31 Union Square West, New York 3, N.Y. W. Barrington Miller's address is P. O. Box 1214, Fort Lauderdale, Fla. Captain Henry E. Wilson's residence is 214 Sequoia Avenue, Palo Alto, Calif.

Since there can be no more news until the next issue of *The Review* in November, we hope that the Class will have a pleasant and interesting summer and that any of the members who come to New York for their holidays will look in and say hello to your Secretary. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York 17, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

These notes go to press before we have any information as to the number of classmates who will be attending Alumni Day. I am hoping that in the next issue I can report goodly representation and also make a more optimistic report on the Class of 1920's standing as regards the Alumni Fund. We are not looking so good at this writing. Those of us who are close to Institute affairs and know how badly needed the new senior dormitory is and how it has been made possible by the Alumni Fund can tell you in all sincerity that you cannot do better by your Class than by the Institute and to put as many dollars as you can spare into this Fund.

General Rolland W. Case is now in Arlington, Va., at 437 North Park Drive. Our famous Captain Edward Ellsberg is now in Southwest Harbor, Maine, getting, we hope, a well-earned rest from his herculean labors. Myron Davy is in Washington, at 3435 Benning Road. Dan Whelan is now a lieutenant commander and is located at Pacific Palisades, Calif. Charles Klingler is in Santa Barbara, Calif. Bob Robillard is in Dayton, Ohio, address 246 Wisteria Drive. I. N. Zavarine has left the Metallurgical Laboratories and is now a metallurgist with Sylvania Electric Products, Inc., Bayside, Long Island. Bunt Murphy has left Lawrence, Mass., for Canaan, N.Y., where he is associated with the Berkshire Industrial Farms. Chick Dana's present address is 295 Madison Avenue, New York City.

For some reason or other, this has been the sparsest season yet as regards correspondence from classmates. Your poor old Secretary would take it very kindly if you would toss in a scrap of news once in awhile. As retiring President of the Alumni Association, I wish I could convey to each and every one of you my own understanding of the potency and worth-whileness of our alumni body and the vigor and power of the institution from which it emanates. It has been a great privilege to serve the association and to represent the Class of 1920. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

The annual closing of a volume of *The Review*, followed by the customary three-month pause, leaves a wealth of pent-up news of Alumni Day until the appearance of the November issue. The summer period will give your secretarial committee an opportunity to rest after the forced-draft operation of the last two issues, but news is nevertheless needed as urgently as during the remainder of the year. Send in yours now, whether or not you have received a request in the mail. And, if you haven't already mailed your contribution to the Alumni Fund which started in April, give Lark Randall a hand with his new responsibilities as class agent by mailing a check direct to the Institute.

It was a pleasant surprise to hear from Robert B. Frost during his stay in New York, attending the executive sessions at the headquarters of his company, the Lone Star Cement Corporation. Bob is superintendent of the plant at Norfolk, Va., and has been with the company since 1925, formerly having charge of production at

plants in Indiana and in New York State. During the war, he served for three years as a lieutenant in the Seabees, assigned to the construction of airfields. The Frosts live at 1215 Colley Avenue, Norfolk, and have three daughters. Betty, who is 16, is finishing high school. Anne and Joan are 10-year-old twins.

George F. B. Owens is another Navy man who is back at his former post as assistant vice-president of the Brooklyn Union Gas Company, according to reports from our neighbor, Henry Gayley.

Robert R. Neyland, a former brigadier general and wartime commander of the Army Service Forces in Calcutta, has received a new five-year contract as athletic director at the University of Tennessee and head coach of the Vol football team.

Edwin T. Steffian acknowledges our welcome to the fold with a letter which says, in part: "You may remember I left Technology in 1919, went to work in Mexico for two years or so, then returned and took up architecture. In 1923, I started in an office in Texas, then came to Boston, then New York, and back to Boston in 1931. I have had my own practice since 1932. In 1941, I set up a procurement agency to purchase materials for the Navy and the various shipyards which were carrying out the construction of seven good-size programs, totaling some 300 auxiliary vessels. After V-J Day I went back to the old grind, and now I am a partner in the firm of DesGranges and Steffian, architects, at 185 Devonshire Street, Boston 10, Mass. We have a number of industrial, commercial, and residential projects, meanwhile doing some work for an eastern university. In 1928, I married Lovina Fowler Smith, of Indiana and a graduate of Indiana University. We have two boys, John Ames and Peter, who are respectively 14 and 11 years old." Ted says that while he was in New York he went to Columbia for a year and took examinations for New York registration. He mentions having seen Irv Jakobson during the war years and is looking forward to seeing more of the fellows at Alumni Day.

As reported in the New York *Herald Tribune*: "The north magnetic pole isn't where we think it is, but 300 miles farther north, Elliott B. Roberts of the U. S. Coast and Geodetic Survey recently informed the American Geophysical Union. Operations in the Arctic are handicapped by lack of knowledge of magnetic conditions in that region. A similar situation exists in the ocean regions of the earth since no survey of these areas has been made in the twenty years since the nonmagnetic yacht, *Carnegie*, was destroyed by fire in the South Pacific."

George Chutter reports visiting Harry Witherow, superintendent of the aircraft instrument division of the West Lynn, Mass., plant of General Electric. Harry drove George up the North Shore route to his home in Clifton for dinner with Mrs. Witherow and the six-year-old twin daughters, Susan and Karen.

Sumner Hayward begs indulgence for not reporting on others in his area this month and cites as the reason his own activities, as follows: "For the past four weeks I have had many unusual experiences during the New York Telephone Company strike. Thank goodness it is over because the so-

called 'management group' certainly put in long hours. I was in four different buildings during the strike and rapidly rose to high managerial positions. I started out as a dishwasher and picker-up of cigarette butts in the headquarters building in Long Island, where there are no central offices. After a week, I was moved out to our Avenue R central office building, where I was initiated into how to collect nickels and pass long-distance calls. I was there only one day, working a 24-hour stretch, and was so good they decided I had nothing more to learn. I kept the night chief operator company from midnight to 8:00 A.M. and felt thrilled when I successfully got through a call to Miami, Fla. I telephoned my wife at 7:00 A.M. and announced myself as the assistant chief operator calling to wake her up. She had already been up an hour — the alarm was set at six, as I had been getting in early to headquarters during the strike.

"I left Avenue R for our Huntington central office without going home and was told I would be building superintendent. I was handed an apron and told to cook and wash dishes for the gang. I did! From 5:30 A.M. to 10:00 P.M., I washed dishes and made coffee, pushing a floor mop and operating a switchboard in between times. The chief operator usually sent girls in one at a time to eat and occasionally asked me to substitute at the switchboard in the meanwhile — in the apron, of course! One 'emergency' call I passed was for 'Dr.' So-and-So. I noticed a grin on the chief operator's face and learned afterwards that he is the town bookie. How people would lie about their 'emergency' calls! After three days at Huntington, I was moved back to Brooklyn, whence I could get home once in a while. I was assigned to 'building maintenance' at the Albermarle Road building, soon being advanced to the top of the organization. After 25 years of service, I reached the peak of my career — I became chief cleaner of the toilets."

The *Kennebec Journal* of Augusta, Maine, tells of a recent visit to his native state of Joseph W. Fowler, a rear admiral, on his return from an inspection tour in Honolulu before a coming assignment in Panama. A naval architect, his work involves inspecting yards and other facilities to determine means for economy and improvement. His service with the Navy includes five years in China, where he helped to build gunboats, four years at Portsmouth, N.H., on the design and construction of submarines, and two years' service as force instructor in command of all submarines on both coasts. During the war he was stationed at San Francisco as industrial manager in charge of 30 private shipyards and responsible for maintaining all West Coast ships in service for war duties. He has a son, a former lieutenant commander, who is now attending the Sorbonne.

Mrs. Palmer C. Putnam is president of the Brookline League of Women Voters, according to an article in the Boston *Traveler*. As Therese Perkins, Mrs. Palmer was associated with us in Course VII. She is the wife of Palmer C. Putnam '23, the inventor of the Army's amphibian truck and recipient of the Medal of Merit. The Putnams have two daughters, one at Vassar and the other at Shady Hill School in Cambridge.

Donald W. Randolph, a former com-

mander, and W. Hoyt Young, Jr., a former lieutenant commander, have returned to civilian life. Don is at his home in Hill Creek Lane, Gates Mills, Ohio, and Bill can be reached by addressing Box 445, Route 2, San Marcos, Calif.

John W. Barriger, 3d, President of the Chicago, Indianapolis and Louisville Railroad, is keeping the "Monon" in the news with widespread accounts of his modernization program. In a statement to the *Boston News Bureau*, Jack announced that the line is buying Diesel-electric locomotives for both passenger and freight service and will be completely dieselized by next October.

Albert H. Wechsler is the subject of a long feature article in the *Boston Post* which Chick Kurth has forwarded. Under a photograph of the Vice-president and general manager of the Converse Rubber Company of Malden, Mass., is a regular Alger account of his rise to fame from his earliest endeavors in the business world at the age of nine. Since our graduation, Al has been a partner in a civil engineering firm, a surveyor with the United States Coast and Geodetic Survey, and had worked his way up to general manager of the Corrugated Paper Mills of Natick when it was sold in 1929. He had been with Converse about a year when the depression started and he was called upon to assume managerial duties and see the company through those trying times. The war brought new problems to the rubber industry, and Al's company co-operated with other manufacturers in shifting to synthetics. His hobbies are fishing and silversmithing, the latter leading to his interest in the Boston Council for Adult Education and teaching the art to others. Al and Mrs. Wechsler make their home in Brookline. They have three children, Jean, who is 19 and a student at Vassar, Anne who is 17, and Joel, ten.

These new addresses have been received: Ralph G. Barrows, I, 59 Essex Road, Chestnut Hill 67, Mass.; Stewart P. Coleman, X, Room 2964, 30 Rockefeller Plaza, New York 20, N.Y.; C. Levon Eksergian, Rock House, Rose Tree Road, Media, Pa.; Brainerd M. Jacobs, II, Henniker, N.H.; Hyman J. Levensohn, XV, 28 Cabot Street, Newton 58, Mass.; Andrew D. Machlachlan, Jr., II, P. O. Box 203, Watertown 72, Mass.; Colonel Edgerton Merrill, X, 458 Beacon Street, Boston 15, Mass.

A very pleasant summer to you all. — CAROLE A. CLARKE, *Secretary*, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

1922

As these notes are being written, the biggest 25-year reunion of all time is only one month away. By the time you read the notes, our first quarter century as Alumni will have passed, and the celebration will be a glorious memory in the minds of those who attended; and we join with those who could not get there in regretting their absence. Stories and details of the reunion will be forthcoming in the near future. It has been a pleasure to receive numerous letters from our distant classmates in connection with this occasion, and these will be used in compiling notes for future issues.

Alan Johnston, a major, who has been in the Army since August, 1940, is now serving his second tour of overseas duty in the Pacific theater as Ordnance officer, Head-

quarters IX Corps. Before entering the service, Alan was a research chemist with Hercules Powder in Wilmington, Del.

The *Boston Post* recently had a photograph of smiling William W. Russell of Brookline, who has been elected president of the National Apartment Owners Association at their April meeting in Washington. Bill is also president of the Boston Apartment Owners Association.

So, with these brief notes, your Secretary signs off and digs into the job of making the final plans for the reunion. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West 10th Street, New York 14, N.Y. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Ellicott Street, Buffalo 3, N.Y.

1923

I hope the members of the Class will find interesting the list of those who have reported in answer to the Secretary's letter of March 15. This is the beginning of a 25-year roll call, and a total of 208 members of the Class had been heard from up to May 1, when the list was printed. The list is being mailed to you all, and I am hopeful that this will prompt a good many more to send in the necessary data in order that by the 25th reunion, we may have a fairly complete picture of where our classmates are and what they are doing. If you have not sent in data, do so now. Making up the list was a pleasant job for your Secretary. Sending it to the members of the Class is an attempt to share with all the others the pleasure of hearing from so many.

The following statistics, of course, are not complete, but I think you may find these brief generalizations interesting. Out of 208 reporting, only 19 men are unmarried or do not report on this point; 189 are married, and 164 of these have children. Only 25 who are married had no children or reported none. The average for the first 208 reporting was a little better than two children each, and eight men had families of five or more. The leaders were Bernard F. Flynn, Anaheim, Calif., with ten children; Bernardo Elosua of Monterrey, N.L., Mexico, and Ramon Abarquez of Pagsanjan, P.I., with seven; James C. Walton, Newton Center, Mass., with six; and O. L. Hooper of Winchester, Mass., George H. Hurley of Staten Island, N.Y., Lawrence J. Tracy of Belmont, Mass., and R. K. Turner of Larchmont, N.Y., with five children each.

A number of men reporting told about their work. Joe Nowell is assistant manager of the engineering department of the General Electric Realty Corporation, Schenectady, N.Y. He says, "After nine years with Stone and Webster, I spent three years in the Great Lakes Region as district superintendent and civil engineer for a dredging company. Subsequently, I was for more than eight years with the Tennessee Valley Authority as design manager and later project engineer for some of their large dam jobs and other work. From 1943 to 1946, I worked for Uncle Sam's Navy as a lieutenant commander, and subsequently commander, in the Civil Engineer Corps, U.S.N.R., including two years as skipper of a construction battalion with about 18 months overseas in New Guinea, Manila, and other parts of the Philippine Islands."

Spike Evans, assistant plant engineer of

the Solvay Process Company in Hopewell, Va., says his son, Robert, was a student at M.I.T. from June, 1945, to February, 1946, then went in the Army and expects to return to M.I.T. this fall. — Frank J. Travers, who is second vice-president (investments) of the Lincoln National Life Insurance Company at Fort Wayne, Ind., says he was with the United States Navy from 1942 to 1945 in the office of the Chief of Naval Operations in Washington, retiring as a lieutenant commander.

Rodney Goetchius writes as follows: "I have been with the American Telephone and Telegraph Company in various capacities ever since 1923. In the present job, I have charge of engineering long distance plants of the company in the states of Pennsylvania and Delaware. Two of the most interesting projects are the Pennsylvania portions of a New York-Chicago coaxial cable system and a New York-Chicago radio relay system."

Joe Cox, engineering manager of the Pacific Coast District manufacturing of the Westinghouse Electric Corporation, says that he has worked with Westinghouse since 1923. His operations cover service and field studies of lightning and mercury arc rectifiers, notably the ignitron. He says he had much fun and satisfaction electrifying for aluminum and magnesium operations in connection with the war effort. He moved to California in November, 1945, and likes it.

I have a nice note from Warren N. Center of Lynn, Mass., who was incapacitated with infantile paralysis in 1926. He has a lively interest in spite of his handicap and reports that he has been doing some photography work and is conducting a modest photograph-coloring and negative-retouching business. — Herb Hayden, who is works engineer of the E. I. du Pont de Nemours Company, Arlington, N.J., says that he is still playing competitive tennis and played competitive hockey up until 1940. His oldest son, aged 22 and married, is an ensign in the Navy and a junior at Bucknell University. Herb is trying to get him transferred to M.I.T.

John A. Frank, architect, writes that he is at present spending a few months at Fort Myers, Fla., as one of two representatives of the firm of Alfred Hopkins and Associates of New York. They are consulting architects in connection with a 1,000-bed, neuropsychiatric veterans' hospital to be built at Gainesville, Fla.

I have heard from two of the girl members of the Class. Helen Miller McDonough is a widow and is teaching at the Girls' Trade School, 56 The Fenway, Boston. — Gladys Farmer Noble is married and living in Enid, Okla. She says a daughter, Barbara, aged 14, is entered at Dana Hall School for this September. Mrs. Noble adds that Barbara is "not bent on M.I.T."

Professor B. E. Proctor of the Department of Food Technology, sends in a clipping from the Olean, N.Y., *Times-Herald* of one day last August. The clipping is a column in that paper in which Nelson M. Fuller, a Course VII man and Olean water superintendent, is acting as guest columnist. The column is devoted to a discussion of fish bait, but the significance escapes me because I am no fisherman.

Theodore Edison was in the news in April in what the New York *Herald*

Tribune describes as the first press statement of his career. Edison is working out a plan which will involve transferring the ownership of 60,000 shares of Class B nonvoting common stock in Thomas A. Edison, Inc., which he owns, to approximately 2,700 Edison employees. This is virtually an outright gift of securities valued at approximately \$1,260,000. The plan involves establishing an association of the holders of this stock, Edison employees, for certain mutual benefits. Edison described the project as not a mere profit-sharing mechanism, but expects it to engage in worthwhile undertakings, such as co-operative purchasing, the making of emergency loans, and other aids to members. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree 84, Mass. HOWARD F. RUSSELL, *Assistant Secretary*, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

1924

George Parker has called a meeting of the Class Fund executive committee in Walker Memorial, on the morning of Saturday, June 14. Cy Duevel, Chick Kane, Frank Barrett, George Knight, Bill Robinson, and Wink Quarles are expected to be on hand. The primary purpose will be the planning of our 25th anniversary gift to the Institute. Much work lies ahead of us, and we shall need the help of every single 1924 man. We have not stood by idly during the last 23 years, but some have been rendering yeoman service to this effort. It is our earnest hope that we may be able to present the most handsome gift to the Institute of any class so far. Each of you will receive more details in due time.

Metropolitan newspapers carried news recently on several 1924 men. We regret to announce the passing on April 24 of Harry Goodman, a member of the accounting firm of Goodman and Goodman. During the war, Harry was a devoted worker of the Louis D. Brandeis Service Club in Boston.

Vincent K. Cates of Melrose, Mass., is being considered for the post of manager of the Boston airport, approval of which is hoped for soon. David C. Kanter was recently elected president of the Kehillath Israel Brotherhood of Brookline. From Bill Correale, Major, U.S.A., comes news that General Courtney H. Hodges, Commander of the First Army, has appointed Colonel Henry N. Sachs, research and sales co-ordinator of Aris Gloves, Inc., to command the 179th Composite Group, Organized Reserve. Henry served in both the European and Pacific theaters in World War II. He lives at 49 East 86th Street, New York.

From Pret Littlefield come a few other class notes. Pret ran into Charlie Frank in the Bankers Trust Company the other day, but didn't have the opportunity to learn much about him. Either Pret or Wink Quarles would like to hear more from him. Pret also advises that Hill Clark is a regular commuter to New York from Westport, Conn. We should also like to hear from Hill.

We are becoming more concerned all the while about the status and happiness of Harry Estill, Fred Hungerford, Doug Elliott, and Johnny Fitch. Should anyone hear of them from the missing persons bureaus of the various police departments,

please advise Bill Robinson or Wink Quarles by wire collect.

We had lunch with Ed Dunlaevy of Phelps Dodge Copper a short while back. Ed's office is at 40 Wall Street, New York, but he spends a good bit of his time with the commercial air lines. He has become quite a student of meteorology, in connection with his flights. — FRANCIS A. BARRETT, *General Secretary*, 234 Washington Street, Providence, R.I. WILLIAM W. QUARLES, *Assistant Secretary*, Hollow Tree Ridge Road, Darien, Conn.

1925

When a man dies in middle life, our regret at his passing may be tempered in part by the knowledge that in spite of his too early loss he has accomplished much in the time allotted to him. Such a man was Ellsworth S. Gray, II, whose death on April 5 is reported in the following excerpt from the *Lynn, Mass., Item* for April 7: "Professor E. Spencer Gray, 45, of 1629 Barker Street, Lawrence, Kansas, son of Mrs. Abbie L. Gray of Saugus, died . . . at his home in Kansas. He was professor and head of the department of mechanical engineering at Kansas University.

"Born in Quincy, he was graduated from Quincy High School, . . . Technology, and Purdue University. Prior to his Kansas tenure he was professor of mechanical engineering at the University of Missouri for 15 years. He was a member of the American Society of Mechanical Engineering, chairman of the mid-west section of the American Society of Refrigeration Engineers, a member of the Society of Engineering Education, a member of the Lawrence, Kansas, Lions Club, and a past master of a Masonic body in Missouri. He also belonged to Sigma Xi an honorary fraternity. He leaves his wife, Mrs. Ethalind (Cooper) Gray of Lawrence, Kansas; a son, David Gray; and a daughter, Anne Gray of Lawrence, Kansas; his mother, Mrs. Abbie L. Gray; and his sister, Miss Edna L. Gray, both of Hyden Road, Saugus."

We learn through an item in the *Hartford Courant* for April 12 of a well-deserved promotion for Don Vaughan, IX-B: "Donald G. Vaughan was appointed manager of the engineering and inspection department of the Aetna Casualty and Surety Company at a meeting of the company's board of directors. . . . He succeeds Walter S. Paine who died March 8. Mr. Vaughan was born in Springfield, Mass., and was graduated from Springfield Technical High School and from . . . Technology in 1925 with a B.S. degree in engineering. He is a registered professional engineer in the state of Connecticut. He is married and lives at 132 Maple Ave., Windsor." Congratulations, Don, and best wishes for continued success.

A release from the headquarters of the First Army, in New York, gives the following résumé of Henry Sachs's service during World War II. Not mentioned in the release, which is quoted below, is the fact that Henry's degrees were in Chemistry, a fact which you Course V men well know: "Colonel Henry N. Sachs, research and sales co-ordinator, Aris Gloves, Inc., 411 Fifth Avenue, New York City, has been assigned to the 179th Composite Group, Organized Reserve, New York, N.Y. . . . and has been approved as commander of that unit. Commissioned a second lieutenant

in 1925, Colonel Sachs was called to extended active duty in 1940 and assigned as chief of the estimates section, Ammunition Division, Office of the Chief of Ordnance. His overseas assignments included the Middle East, Mediterranean, and Central Pacific theaters. In 1941, he was attached to the Ordnance Section of the United States Military North African Mission and served in Palestine and Syria. Returning to the United States in 1942, he was assigned to the security and safety branch of the office of the Chief of Ordnance in Chicago. In 1943 he was made ammunition officer of the Island Base Section in Hawaii. He returned to the European theater in January, 1945, where he served in the supply section of the headquarters of the Mediterranean theater of operations. Colonel Sachs wears the Silver Star Medal, Legion of Merit Medal, Army Commendation Ribbon, American Defense Service Medal, European African Middle Eastern Campaign Medal, Asiatic-Pacific Campaign Medal, and the World War II Victory Medal. Born in San Francisco, Colonel Sachs received most of his formal education in the East. He was graduated from the Brown School of Tutoring and holds bachelor of science and master of science degrees from . . . Technology. He also attended the Army Industrial College. He is a member of the City Athletic Club, Technology Club, Grand Jurors Association, Army and Navy Country Club, American Association of Textile Chemists and Colorists, the Officers' Club of the Army and Navy, the Reserve Officers' Association, and the American Legion. Colonel Sachs and his wife, Jane G., and their daughter, Mary Adler (age 7), live at 49 86th Street, New York City."

In the May issue of *American Business* is a full-length article, "General Shoe — and 'How It Grew,'" which some of you may have had an opportunity to read. Although it deals more with business policies and activities than with personalities, it includes an excellent résumé of the career of Maxey Jarman, VI, whose father, J. F. Jarman, was the founder of the company. For more details than I have space to quote here, I suggest that you look up and read the entire article, a sample of which follows: "Mr. Jarman's son, W. Maxey Jarman, started with the company at the beginning and has held a variety of positions . . . culminating with the board chairmanship in March, 1947. He was educated at . . . Technology, and started as a clerk . . . At various times he has been credit manager, office manager, receiver of incoming freight, buyer of findings, advertising manager, leather buyer, sales manager and secretary and treasurer. He was appointed president of the company in 1932."

Of great interest to me, as a personnel man (and there are others in this field among our class members) is the following policy statement which appears over Maxey's signature in General Shoe's employee handbook: "Every person in the company shall have the right, and be given the opportunity, of expressing himself freely on any matter of interest to him. The company will keep any promise made to an employee. Employees shall be paid as good and generally better wages than are paid for similar work in the community." Although not every company is

in a position to follow the third policy, no company would be the worse off for adhering to the first two. On this rather philosophical note, I'll sign off for the summer and wish you all a pleasant and profitable vacation. — HOLLIS F. WARE, *General Secretary*, Box 52, Godfrey, Ill. F. LEROY FOSTER, *Assistant Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

1926

To Alan E. Cameron go our friendly good wishes as he assumes his new post of president of the Nova Scotia Technical College. We hope that the satisfactions he will derive will more than offset the inevitable and exacting responsibilities of such an academic post. In commenting upon the appointment, the *Canadian Mining and Metallurgical Bulletin* paid him the following tribute: "... When he assumes his new duties ... [Dr. Cameron] will be returning to the academic field after a ten-year period of administrative work as Deputy Minister of Mines for Nova Scotia. ... It is unnecessary here to elaborate further on the service he has rendered ... the coal mining industry. ... He has been particularly active in matters having to do with the status, welfare, and education of engineers. Dr. Cameron's personality can be best expressed by a single word — dynamic. Following the scientific method in which he has been trained, he studies very carefully any matter in which he is interested before forming an opinion, but once he has decided upon a course of action he is most persuasive in converting others to his point of view. With his wide knowledge of the conditions in, and the needs of, the mineral industry, his extensive academic experience in training men for the industry, and his proved administrative ability, Dr. Cameron is the ideal choice to succeed Dr. Sexton as President of the Nova Scotia Technical College."

Professional recognition and extracurricular recognition have lately come to Bob Dean. He is a partner in the firm of Perry, Shaw and Hepburn, which has designed the projected Jordan Marsh Company building in Boston. He has also been appointed acting artillery commander of the reactivated Bay State 94th Infantry Division. — At least three of our classmates have taken to the public platform in recent months: John Ostborg addressed a dinner meeting of the Society of Automotive Engineers in Cincinnati on "Diesel Engines in River Boats." Edgar Stevens spoke on "Alcoholism — a Public Health Problem" when he addressed St. Mary's Book Club in Lynn in the spring. And in Haverhill the Kiwanis Club heard Marron W. Fort discuss "The Role of Research in Small Business."

A delightful pseudocomic folder on Charles Stark Draper, prepared by his associates, limns his contributions in the field of gyroscopic control devices and kindred gadgets, which are among the memorable achievements of the war. Despite the spoofing accorded our distinguished classmate, there is a definitely serious undertone in the entertaining pamphlet. It prompts your Secretary to the observation that even if the target reads "Repard," it simply means "Draper" when spelled backwards. May his targets always be the very highest, for no matter

how high they fly, Draper will find them. This is our sight-ation.

Several members of the Class have, or will soon have, sons at the Institute: John Wilbur's son is now a student here, as is Dave Sutter's son, and next fall Ted Mangelsdorf's son will enter. Have I missed any others?

The firm of Reinhard and Hofmeister have taken into partnership John Walquist, who has been associated with them for 15 years on all their work. They will now carry their practice under the firm name of Reinhard, Hofmeister and Walquist at 145 East 32d Street, New York City. Walquist studied architecture at the University of Minnesota as well as at M.I.T. He attended the American School of Fine Arts at Fontainebleau and has taught at the University of Oregon. — The engagement of Donald C. Chase to Harriet Stahl of New Haven was announced in April. Chase is with the Farrel-Birmingham Company in Ansonia, Conn.

Donald Dodge, who is general superintendent of the United States Rubber Company in Providence, is now living in Cranston, R.I. — Chester Peterson has moved to Washington, D.C., and is with the National Bureau of Standards. — Lester Schoenfeld, who was a lieutenant colonel in the Army during the war, has become sales engineer with the Fairfield Company in New York and is living in Stamford, Conn. — John Murlin is now with the Macartney Manufacturing Company of Lansing, Mich.

The success of our reunion at the Wianno Club last year has prompted our first annual reunion this year. Plans made under the direction of Pink Salmon, as this is written, called for a group to meet at Wianno in June. By the time this reaches you, our 21st reunion will have been celebrated. Perhaps we have embarked on a program of annual get-togethers, which would be a highly desirable arrangement. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1930

Maurice Herbert has written a letter concerning some of his recent activities, and his first paragraph is passed along verbatim in the hope that it may be contagious: "I follow with considerable interest the doings of the 1930 men in *The Review* and feel that it is about time that I made a contribution to the cause myself." Maurie spent three years in the Army, ending up on the West African Gold Coast and returning to his old job with Du Pont in November, 1945, after his discharge. About a year ago, he started the Franklin Paint Company in Franklin, Mass., and in this short time has built up a very good business in house and traffic paint. While still with Du Pont, he saw Dick Berry in Indianapolis. Dick's war job was at the Denver Arsenal, and he is back again with Barbasol. Maurie also met Herb Wampner in San Francisco, where he is working for Reichhold Chemicals. (More letters like the above will help greatly in keeping the Class informed of the doings of you all.)

Carlton Vanderwarker of Wellesley has been elected assistant secretary of the American Mutual Liability Insurance Company. He has been with this company

since 1934 and served three years in the Navy as a gunnery officer. — Ferdinand L. Rousseve, professor in charge of the fine arts department at Xavier University in New Orleans, has been selected for membership on the Catholic Commission on Intellectual and Cultural Affairs, which will co-operate with the United Nations in promoting world understanding. — Word comes from Tsing Hua University in Peiping that Robert Chao is a professor in the mathematics department and Liu Wu is a professor of structural engineering. — Ralph Balch is now in Staunton, Va., with the Staunton Textile Corporation. Marvin Dixon is working for the St. Regis Paper Company in New York City. Myron Leedy, a colonel, is at the Field Artillery School of Fort Sill, Okla. National prominence was given recently to an invention of Hermon Scott's which will eliminate record scratch and permit high fidelity broadcasting of recordings. There is much more to it than that, of course, and you'll pay for it all when you buy your next radio. — The new secretary of the Society of Naval Architects and Marine Engineers is a 1930 man, Wilbur N. Landers, a naval captain with headquarters in New York City. The new secretary of the New England section of the same society is your Class Secretary.

The July issue of *The Review* generally contains an appeal for (1) more class news from classmates about other classmates and themselves and (2) continued support of the Alumni Fund. This year is no exception, and the Class is justly proud of its improved showing in the Alumni Fund standing. Let's help Phil Holt all we can in keeping 1930 at or near the top! A pleasant summer to you all! — PARKER H. STARRATT, *General Secretary*, 1 Bradley Park Drive, Hingham, Mass. ROBERT M. NELSON, *Assistant Secretary*, 332 South Michigan Avenue, Chicago, Ill.

1931

The plea in this column in the May Review for notes on 1931 doings brought at least one gratifyingly prompt response. Within a week a little card tied with a blue ribbon announced the arrival on May 7 of one Peter Ludwig Hesselschwerdt. It's a little hard to realize that Peter's father, better known as Hessie or Lou, is now an assistant professor of mechanical engineering at the Institute, and a growing influence in the field of heating, ventilating, and air conditioning. Incidentally, this seems as good a time as any to point out that Lou is also class agent for the Alumni Fund, and that he would more than appreciate receiving your contribution if you haven't already sent it in. Lou's address is Room 3-231, M.I.T.

The engagement of Alice Campbell of Arlington, Mass., to Arthur Lutz was announced in Boston papers in February. Those members of the Class who had the good fortune to attend our 15-year reunion in June, 1946, will recall that Art was one of the "men of distinction" who crewed Art Newell's boat from Huntington, Long Island, to the reunion site at old Saybrook, Conn. Lutz wound up four or five years in the Army as a lieutenant colonel in Ordnance, and is now back with his lumber business in Brooklyn. So, if you're building. . . .

Secretary Locke '96 reports that Laurence C. Hicks, III, has been appointed assistant director of research for the Allegheny Ludlum Steel Corporation. Dr. Hicks has been with the company since he received his Sc.D. at the Institute in 1933. Secretary Locke has also had an interesting letter from another Course III man, Donald L. Herbert, who is now completing 30 months with the Army in Europe. Captain Herbert has had the somewhat unenviable job of being a post engineer in Kassel, one of the most heavily damaged cities in Germany. During the coldest winter in Europe in two generations, his main source of building material has been scrap iron.

Regretfully, we must report the death of Albert E. Mulliken, announced in a dispatch to the *New York Times* from Pelham Manor, N.Y., dated March 2. His widow, Mary Sullivan Mulliken '26, is a graduate of Course VII and is teaching in a high school in their home in Silverton, Colo. The following details were supplied by Albert's father, Harry B. Mulliken: Albert Edgerton Mulliken, a long-time resident of Pelham Manor, N.Y., died on March 2 in a hospital at Telluride, Colo., after a stroke. He was 49 years old. For the past two years Mr. Mulliken had been superintendent of mining operations near Silverton, Colo. He was the son of Harry B. and Ellen E. Mulliken of 128 Reed Avenue, Pelham Manor. Born in New York City on February 22, 1898, he had lived in Pelham Manor since 1901. He attended elementary schools there and later the New Rochelle high school. He was a student of Brown University and in 1931 received a metallurgical degree in engineering from M.I.T. He was a former member of the Echo Bay Yacht Club and a Navy veteran of World War I. Surviving, in addition to his parents, are his wife, Mary Sullivan Mulliken, and four children, Harry B., now in the United States Marines at Pearl Harbor; John C., Judith Anne, and Mary Sharon; three brothers, Champlin of Higganum, Conn.; John B. of Jackson Heights, Long Island; Richard F. of Seaford, L.I., and a sister, Mrs. Seth W. Heartfield of Baltimore. — JOHN N. HIGGINS, *General Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

1934

At the January 10th meeting of the Radio Club of America held in Pupin Hall at Columbia University, Jerry B. Minter, chief engineer of the Measurements Corporation in Boonton, N.J., delivered a paper entitled "Measurements on F.M. Receivers." The paper outlined the present Radio Manufacturers Association frequency modulation receiver test procedure. Emphasis was placed on receiver characteristics deserving special consideration. Some information was offered with regard to the testing of F.M. signal generators, since this is also of interest in testing F.M. transmitters.

Lawrence A. Davenport, who is now at 208 West End Avenue, Cambridge, Md., reports that he has an infant son named Jacob Ellwood. Lawrence was graduated in 1935 from Boston University's college of business administration with the degree of B.S. He also completed a course of study during the summer of 1938 at Southern Methodist University, Dallas, Texas, and

received in that year from the State Department of Texas a first-class high school state certificate, entitling him to teach in all grades of public schools in Texas. This certificate expired in 1942, when he was serving in the United States Army. He is now discharged and as a veteran is planning to take advantage of the government privilege affording him further education, especially in social science or personal relations.

Ferguson R. Jansen has been promoted to the position of materials superintendent at the Fore River Shipyard. Ferguson attended the University of Washington in Seattle, Wash., before entering Technology. He is a Bethlehem-trained executive and was superintendent of materials at the Hingham yard on 227 ships. He is a member of the Society of American Shipbuilders and Designers.

John T. Burwell, Jr., was married in June to Katherine G. Despard, daughter of Mr. and Mrs. Clement L. Despard of New York. Miss Despard attended St. Timothy's School in Catonsville, Md., and later Barnard College. John was discharged from the Navy in 1946 as a commander and is now an assistant professor of mechanical engineering at the Institute. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, Chile Exploration Company, Chuquicamata, Chile.

1939

Myron Norman writes from Glendale, Calif., that he is now happily situated in that locale and working with the L. H. Butcher Company of Los Angeles, selling chemicals and equipment. In addition to his admirable chamber of commerce attitude, he is also the proud papa of a baby daughter.

In our spring weddings department we find that Irv Cohen married the former Olive Perlman of Dorchester, Mass., on April 13. Also, Melvin H. Rosen, a major now serving with the Regular Army, was recently married to Olive Oppenheim of Beverly Hills, Calif.

Best wishes all around for a pleasant summer and high hopes of hearing from you all while on that vacation. — STUART PAIGE, *General Secretary*, 701 Mill Plain Road, Fairfield, Conn. ROBERT C. CASSELMAN, *Assistant Secretary*, 271 Cypress Street, Newton Center 59, Mass.

1940

We have heard that M. F. Biancardi has been named manager of the health and safety department of the Allis-Chalmers Manufacturing Company, in Milwaukee, Wis. Biancardi, who is active in numerous safety and health associations, has been associated with Allis-Chalmers since July, 1940, and served as safety engineer in the firm's health and safety department before being appointed to his present post.

Frank A. Yett of Portland, Ore., has been awarded a fellowship by the National Commission of Culture of the Argentine Government for the study of Argentina's industrial development during 1947. After working for the Reynolds Metals Company in Alabama and Longview, Wash., he served as a lieutenant in the Navy until early 1946. A veteran of seven naval campaigns in the Pacific, he is the holder of

the Bronze Star and the Navy Unit Citation. Since leaving the service, Mr. Yett has been attending the School of Advanced International Studies in Washington, D.C., and on January 26, received the degree of Master of Arts in Economics from that institution. The Argentine Government, which has recently launched its country upon an extensive five-year plan of industrialization, has invited outstanding young engineers and economists from 16 Western Hemisphere countries to form an expert group to study the plan and its effects upon the country. Mr. Yett will represent the United States in this group, being eminently qualified in both the technical and economic fields with which the industrialization program is vitally concerned. He will leave shortly for Buenos Aires, accompanied by his wife.

John McEvoy, who is on the staff of the Department of Labor in Washington, D.C., recently completed a special training course in the Federal administrative interne program. Mr. McEvoy is a veteran of World War II and has had six years of government service since graduation.

Joe Havens and Teresina Rowell were married early in the year. Virginia Milnes Warren and Philip Stanley Wheelock were married on April 5. — Won't you drop us a line sometime during the next few months so that we'll have a little news for our first fall printing of *The Review*? — H. GARRETT WRIGHT, *General Secretary*, Garrett Construction Company, 510 Sherman Avenue, Springfield, Mo. THOMAS F. CREAMER, *Assistant Secretary*, 6 Berkley Road, Scarsdale, N.Y.

1942

We have many weddings and engagements to announce this month. First we have the marriage of Betty Wainwright of Great Neck, Long Island, to John M. DeBevoise, XVI. John has a master's degree from Cal Tech. He is with the Ryan Aeronautical Company of San Diego. Bill Devine, X, and Chloe Janet Gilmore, both of New Bedford, Mass., were married in March. Bill is now with the plastics division of the Monsanto Chemical Company in Springfield, Mass. Margaret C. Stewart of Wilmington, Del., and Clarence Eckmann were married on May 3 in Wilmington.

We have also the following engagements: Edna Louise Noll of Greenwich, Conn., to Karl Wenk; Mrs. Caroline Oveson Whitney of Southboro, Mass., to Richard Lovelace; Jeanne N. Posselt of Pelham Manor, N.Y., to Albert Clear; Joan D. Thomas of East Orange, N.J., to Harry Helm; and Sidney G. Burke of Wellesley, Mass., to Thomas Carroll.

Here is a letter from Dave Friedman. He is living in Brooklyn with his wife and (as of May 6) his baby daughter, Rosalind Faye. He says in part: "Many things have happened since I last saw my name in the class notes. In January of 1945, I married Anne Schwartz of Brooklyn, N.Y. I believe a number of the boys know about it by word of mouth. I've met quite a few of the boys at one gathering or another of the American Institute of Electrical Engineers or the Institute of Radio Engineers. I met Ervins Rips at the I.R.E. convention last month. He's an instructor at Carnegie Institute. I've also met Bob Kraus, George

Schwartz, and a few others here in New York. Last July, I left Federal Telephone and Radio, where I was a project engineer on very high frequency navigation receivers and direction finder systems. I am now with Radio Inventions, Inc., of New York as an advanced electronic research and development engineer on facsimile systems. It's extremely interesting work. There is much theoretical work to be done on filter theory. Ira Sedwitz '38 is also with this company as optical system engineer."

George Kavanagh, V, and his wife, Mary, are parents of a son, George, born in May. Mr. and Mrs. Stephen H. Dodd, Jr., announce the birth on April 24 of a daughter, Katherine Helene. Steve is with the Servo Lab here at M.I.T., where he is working on high-speed electronic computing machinery.

Our Class Agent, Lou Rosenblum, sends a long letter telling much news of many persons. Lou is with the Polaroid Corporation in Cambridge and is one of us hardy souls who are still unmarried. Some of the news he sends in includes the following: Bob Greenes is to be married in New York on June 15 to Rhoda Reig. Marty Levene and his wife, Irma, are living two floors above Lou, while Marty goes to Boston University medical school and she practices as a dietitian at the Newton Wellesley Hospital. Dick Seidman has gone into business for himself in Connecticut and New York, designing and building both office equipment and toys; he is also sailing in the Snipe Class sailboat fleet in Norwalk Harbor, where he won many races in the years before the war. He and his wife, Dorothy, have a little son, David Andrew, born last November. Rod Flinchbaugh is still with Lou at Polaroid, where both of them are working on the design and development of the new hand, 60-second camera. Monroe Brown, formerly a lieutenant colonel in the Air Forces (and ranking officer of our Class), is back in Washington as head of the helicopter division of the Aircraft Industries Association.

Lou also encloses a letter from Bob Jacobson, which says in part: "I have been with the Sperry Gyroscope Company since I left the Radiation Lab a year or so ago. Next door to me is Bob Fabacher. Others at Sperry include Hank Brewer '40, Charlie Chubb '43, Bob Gould '40, John Hess '43, Bob Edwards '41, and Neil Farnsworth '41. George Schwartz is with the Arma Corporation in Brooklyn and is married. I see him around New York along with Dave Nicholson, who is with Kollsman Instrument, and occasionally Bob Kraus. About a month ago Charlie Estes arrived in town from Istanbul and points between. He and his wife, Vera, had spent seven months visiting his father, who is still teaching at

Robert College. He has now begun work for Federal Telephone and Radio, I believe. He tells me that Higdon and Van Meter are teaching electrical engineering at Penn State."

As you read this, Alumni Day is long past. As I write this, however, it is only May 20; so I can't give you much news about what happened on June 13. I want to say to one and all how much the letters that you write are appreciated. They go to make a column that is more interesting to everyone. — WARREN S. LOUD, *Acting Secretary*, Room 2-272, M.I.T., Cambridge 39, Mass.

1944 (2-44)

I ran across Jim Barnes in the Ford Motor Company. He is in the purchasing division. We had lunch together, and I got the low-down on his activities during the past few years. After his graduation from Tech in Chemical Engineering, he joined the atomic boys and found himself in Oak Ridge during the war. Only last March he left the atomic bomb research in quest of something far away from engineering, and lo and behold, he ends up in the economic game. Jim is married and now has a son, born last February, who answers to the name of Jim, Jr. They are living with his parents in Detroit until they can find an apartment.

The weddings at this writing include that of Gardner E. Alden, who married Virginia Dyer at Framingham, Mass. Richard Bersohn and Virginia Straus have announced their engagement in New York. She was graduated from Brearley School in 1944 and now is a senior in Vassar. Also announced is Elizabeth Sackmann's engagement to Donald Miller Black of Jacksonville, Fla.; he is an alumnus of Rensselaer Polytechnic Institute and was a research chemist with the plutonium project at Oak Ridge during the war.

The following are the latest changes of address; Thomas Carmody is now in the department of chemical engineering at the University of Delaware at Newark, Del.; Pei Chao is in Chicago, Ill; Miguel Chapiro works for the L. N. Barry Company in the engineering department, located in Cambridge, Mass.; Everitt Cole is with the Hillman Barge and Construction Company in Pittsburgh, Pa.; Bob Cooper-Smith is in Far Rockaway, N.Y.; Gerry Dennehy lives in Garden City, Long Island, N.Y.; Bill Engelmann is still in Brookline, Mass.; Herbert Graetz, New York City; Paul Heilman is in Erie, Pa.; Arthur Hoge, Doylestown, Ohio; Dick Houghton, Littleton, Mass.; Jules Lobsitz, Glen Ridge, N.J.; George Manning, Weston, Mass.; Mort Meyer, South Orange, N.J.; Edwin L. Moyer, Jamesville, N.Y.; Roger Patterson, Webster, N.Y.; Bob Peck, Sharon, Mass.;

Geoffrey Robillard, St. Albans, W. Va.; Spencer Schilling, Bellerose, Long Island, N.Y.; Caesar Spero works for the Owens Corning Fiberglass Corporation at Ashton, R.I.; Bill Tierney, Dorchester, Mass.; Andrew Vallone, Brooklyn, N.Y.; Henry Whitaker, Penn Yan, N.Y.

Paul Robinson was in Washington and telephoned my family. He is working for the Martin Bomber Company in Baltimore in the capacity of a draftsman. Beverly Tucker is now an engineer at Chance Vought in Stratford, Conn. If anyone is interested in obtaining a classmate's present address, just drop me a line, as I have most of the addresses on file. — WILLIAM B. SCOTT, *General Secretary*, Care W. P. Dunlap, Hickory Isle, Mich. MALCOLM G. KISPERT, *Assistant Secretary*, Room 3-308, M.I.T., Cambridge 39, Mass.

1946 (2-46)

The list of those "looped and duped" grows longer month by month, and we are passing out the good news as it comes along. On May 10, William E. Becker married Rosamond Gilman Sanford of Manchester, N.H. The engagements of Mansoor Rafaat and Martha Jane Ferrenz of Washington, D.C., of William H. Auerswald and Doris Ruth Oechsle of Longmeadow, Mass., of Herbert G. Keating, Jr., and Mary Dorothy Driscoll of Dorchester were announced.

Our Class President, Herb Hansell, who is at Yale studying in the law school, has been named treasurer of Yale Law School Student Association. Herb also participated in the mock trials, arguing in the case of *New York versus the Ford Motor Company*. Ken Hauser has resigned his Navy commission to become a second lieutenant in the Army Air Forces.

A random view of the Class shows that Bill Cahill is in school out at the University of California at Los Angeles, while Stu Edgerly, Bud Brylawski, Bob Spoerl, Ray Brown, and Ted Henning are doing the same here at Harvard and Columbia. Jack Aitken is working for Helicopter Corporation, Bill Humphreys for Westinghouse, Bill Becker for the Manchester Yarn Mills, Bob Walters, Ken Davis, Bob White, Ed Hill, and your Secretary for General Electric, Ned Tebbets for the John Hancock Insurance Company, and George Ley for Frigidaire. Howie Perlmutter, Class Agent, is at Clark University in Worcester doing work in labor relations. Your Secretary hopes to give, in the near future, a complete documentation of the doings of members of the Class in monthly installments. — JAMES S. CRAIG, *General Secretary*, 5 Rockingham Street, Lynn, Mass. THOMAS F. KELLEY, JR., *Assistant Secretary*, 578 Andover Street, Lowell, Mass.

The Review is not published during the summer months following July. This issue, therefore, concludes Volume 49. Number 1 of Volume 50 will be published on October 27 and dated November.



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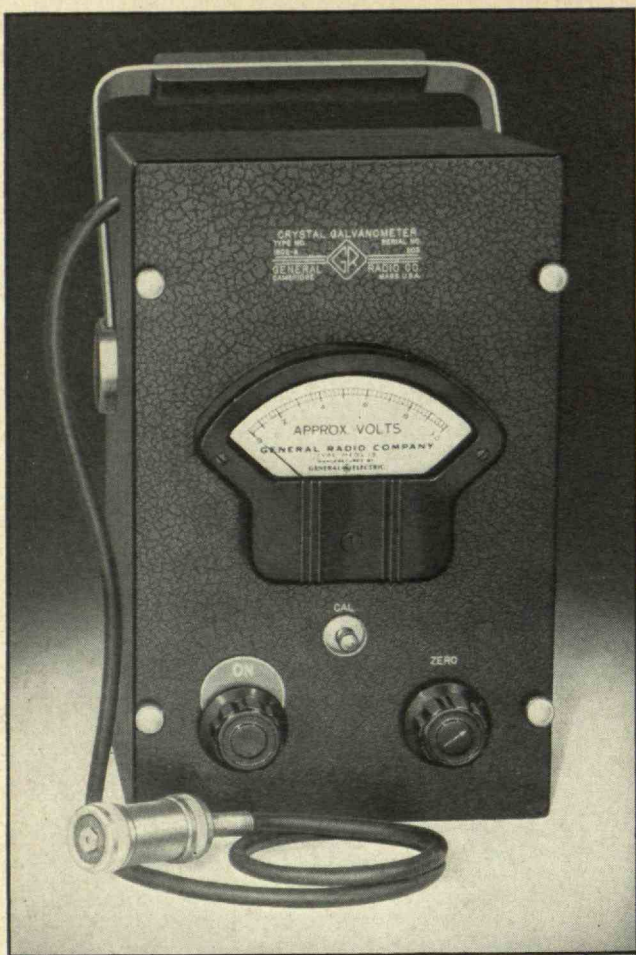


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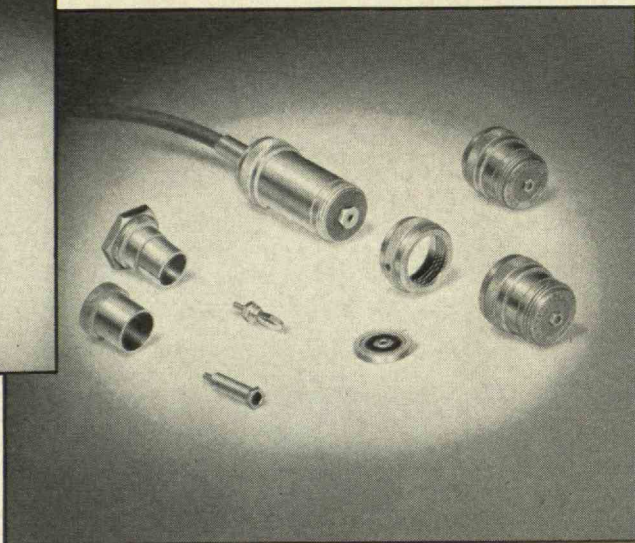
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